The PHOTOFACT Servicer

September 1, 1950 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ Vol. 11, Nos 105 & 106

"Happiness may be thought, sought or caught - but not bought." - Anon

INTERESTING NOTE

During the 4-month period (April 1 to July 31) manufacturers introduced 976 new models -

767 - - - Television
209 - - - Radio

PHOTOFACT continues to bring you unexcelled, complete, accurate, uniform data at the lowest possible cost.

* * *

THIS IS FOR I. R. C. USERS

Ed Johnson, Sales Service Engineer for International Resistance Company, writes:

"In connection with Concentrikit, we have something that might be included in one of your Servicers as an aid to servicemen. After Concentrikit is assembled, remove adhesive sticker from terminals that has IRC Base Element Numbers stamped on it and apply around outer periphery of the same control cover to serve as a future method of identification. We pass this idea along for whatever it may be worth."

* * *

IMPORTANT CORRECTION NOTICE

The following Folders have incorrect listing headings for Centralab replacement capacitors:

Set No.	Folder No.	Page No.
93	2	13
93	6	2
94	6	14
95	3	16
99	17	14
100	1	18

Under "Capacitors," change the headings from "Cornell-Dubilier Part No." to read - "Centralab Part No."

HAVE YOU SEEN THIS?

RULES FOR TELEVISION GUESTS

1. Seating -

The overstuffed chairs in the front row are reserved for guests over eighty and members of the immediate family. Good seating will be found in the second row (dining room chairs), and third row (kitchen chairs), with standing room available between the piano and library table.

2. Picture Quality -

Guests will not tamper with brightness, clearness, focus, volume or anything else. If the picture appears too bright or too dark, too high or too low, too this or too that, leave quietly, remembering that we prefer it that way.

3. Refreshments -

Under no circumstances will the proprietor or his family be goaded, teased or shamed into serving anything whatever in the form of food or drink. Clean glasses will be found on the kitchen sink. The faucet on the right is the cold.

4. Comparisons -

We have no interest in the names, makes or locations of television sets that (a) have larger screens, (b) produce clearer pictures, (c) are easier on the eyes or (d) are better in any other way. Of this set we simply say (a) it is ours, (b) it is paid for, and (c) look who's talking.

5. Exits -

All doors open outward and can be used at any time. In any case, they shall be used within five minutes after the program is terminated.

6. Program Termination -

A simple majority of the immediate family may vote when to turn off the set.

7. Future Programs -

No future programs until further notice.

8. A Final Word -

Good Night!

- Courtesy of Hyde's Record & Radio Shop,
Williams Street
Crystal Lake, Illinois

* * *

WE'LL PAY $5.00 FOR YOUR IDEAS ON NEW WAYS TO USE PHOTOFACT FOLDERS

Have you found some novel way of putting your PHOTOFACT Folders to work so you get extra value and help from them? Tell us about it, and if the idea is good enough to pass on to thousands of your fellow PHOTOFACT subscribers, we'll print it in the "Servicer" and send you a crisp $5.00 check. Here's one practical suggestion we've received that was well worth $5.00:

"I have found your PHOTOFACT Folders very useful in making the public service minded. When a customer watches me repair his set I always get the PHOTOFACT down for reference and show him the technical interior of his set.

"The schematic diagram, complete parts list and the thorough tuning instructions convince the customer that with information like that we can hardly go wrong on the service. This has brought many new customers and proved that the Folders have paid for themselves many times and in many ways.

"Lots of luck to you and keep the good work coming."

H. D. Glenn
Joiner Radio Service
El Dorado, Arkansas

* * *

Got a hint or kink to match this - some other ingenious way in which you use PHOTOFACT Folders? Send in your ideas - they may be worth $5.00 each. Start 'em coming!

Address your letters to HOWARD SAMS, c/o PHOTOFACT Servicer.

* * *

FIELD EXPERIENCES -

For every "Field Experience" published, we issue a certificate good for one PHOTOFACT Folder Set. Awards are issued at the time of publication. Since it is impossible to verify the accuracy of contributions, we cannot be responsible for either the diagnosis made of the receiver trouble, or the results which will be obtained by following the suggested repair routine. All contributions become the property of Howard W. Sams & Co., Inc.

SENTINEL Model 415 TV
Photofact Set No. 100, Folder No. 11

This letter is in regard to another letter of mine written June 12th, in which I asked for a schematic of a Sentinel Model 415 Television Set and also as to what the trouble might be that the picture tube would not light up until the set had been on from fifteen to twenty minutes.

I received a reply from you dated June 13th in which you advised me to check the 1X2 rectifier tube, also to see if the wave form was present at the grid of the 6BQ6 horizontal output stage, and also to check the resistors that form the filter from the cathode of the high voltage rectifier to the picture tube accelerating anode, to see if the resistors had opened up in value.

I did the things that you stated to do and found all these things checked good. After much deliberation and checking I finally substituted the picture tube itself, which is a 12AP4, in this particular set. This remedied the trouble. It seems that the picture tube would not emit electrons until about so hot and then would gradually emit electrons, this producing a dull raster at first and later a bright raster. The dull raster would not appear, however, until the set had been on for a period of at least fifteen minutes. During that warm-up period the tube remained black.

Incidentally, I have Sams' PHOTOFACTS complete and up-to-date. I like them just fine. My distributor, with whom I have a standing order for Sams' is Hicks Radio Company, Lincoln, Nebraska.

Myron B. Roker
Roker's Radio & Television
Sales & Service
Clatonia, Nebraska

PHILCO 49-1609
Photofact Set No. 53, Folder No. 19

Complaint: When set was turned on, and as it warmed up, a strong peculiar buzzing, similar to an AC hum practically drowned out all signals.

Cause: Set was removed and brought to the shop and given a complete check. Outside of a weak tube nothing could be found wrong. After replacing set in customer's cabinet and making a preliminary test, set functioned O. K. Still puzzled, I decided to leave set for customer to try, and completed bolting set in and plugged in phono. Buzzing returned.

Remedy: Discovered that plugging in phono motor leads created the trouble. By checking diagram found that reversing the leads would correct the trouble. Motor leads were not coded, and reversing permitted AC to enter antenna circuit through band switch of which motor switch is a part.

PHILCO C-4608 (Mopar 802)
Photofact Set No. 42, Folder No. 19

Complaint: Push-buttons operated O. K., but dial tuning was dead.

Cause and Remedy: Checked all dial tuning parts and coils and found O. K. Suspected moisture might be the cause, so I removed the dial tuning coils and baked with a 500 Watt infra-red light 30 minutes at 12 inches. Doped coils and replaced and have had no further trouble with this set.

Editor's Note: Both above Field Experiences contributed by:

E. W. Clawson
Clawson Repair Service
3780 Thornton Drive
Silverton 36, Ohio

* * *

CROSLEY Model 9-105
(Serial 1528 375559)
Photofact Set No. 59, Folder No. 70

Complaint: Volume (sensitivity) very low on all bands.

Remedy: Tried swapping tubes, as oscillator voltage measured across oscillator section of tuning capacitor by means of AC VTVM appeared very low. No good. Checked every paper capacitor in set without turning up any bad ones. Tried realignment, which went fine until first 6BJ6 stage was reached. Used the point-to-point voltage measurement chart on 6BJ6 stage and found a small positive voltage on the grid of the tube taken with respect to common B minus. Had bright idea, but check of diagram showed this tube's cathode goes directly to B minus bus. Started gingerly trying various padders associated with grid, and grid-return circuit. No avail. Finally traced circuit to mica capacitor, Item C6. If this leaked we might get positive on grid, I figured. I cut one end of this capacitor loose and lo, the darned set nearly jumped off the table - had gain no end!

This capacitor is a small yellow bakelite postage stamp capacitor, rated at 30 MMFD, 300 Volts, and hides between coil and chassis. Checked capacitor and could find no leakage under five thousand megohms, but it sure wouldn't work in the set. Replaced with a miniature ceramic of proper value.

Joseph L. Boswell, Manager
Lincoln Radio Service
2128 S. W. Third Avenue
Portland, Oregon

* * *

EMERSON Model 651D TV
Chassis 124B

Complaint: Raster blanks out intermittently accompanied by arcing noise.

Remedy: If removing the lead that plugs into the 500 MMF capacitor (C92) eliminates the arcing noise, replace the capacitor.

Note: With the C92 out of the circuit, the raster will have much less brilliance and will bloom and distort.

CAUTION: High voltage.

Mack Kunzman
Jamke Radio & Appliances
231 Cortland Avenue
San Francisco 10, California

* * *

GENERAL ELECTRIC Model 10T4 TV
Photofact Set No. 96, Folder No. 4

Complaint: No raster, sound, low voltage or high voltage - but the tubes light up.

Remedy: Check the 4.6 ohm current limiting resistor for open. This is item R115 as per

PHOTOFACT Folder, and located between the two selenium rectifiers.

James Moudry
5405 W. 23rd Place
Cicero 50, Illinois

* * *

GENERAL ELECTRIC Model 810
Photofact Set No. 53, Folder No. 12

Complaint: Very little control of height.

Cause: C76 in integrating network has low resistance short.

Remedy: Replace C76 with known good unit.

WHISTLING OR SQUEALING RECEIVERS

Check for open or poor connections from shield, base or shell to corresponding pin. This has been the cause of complaint in many a set, especially auto sets.

Editor's Note: Both above Experiences were submitted by:

J. W. Smith
The Radio Shack
1602 W. Pratt Street
Baltimore 23, Maryland

* * *

FADA Model R1025
Photofact Set No. 95A, Folder No. 5

Complaint: No picture, no sound, no raster, but high voltage O. K. Bias on video almost doubles in value.

Cause: 40 MFD. shorted in multiple capacitor on low-voltage power supply. This overloads 80 MFD., 150 Volt, low voltage capacitor so that it starts to cook.

Remedy: Replace Capacitor.

W. Graham
Graham Laboratories
19 Main Street Park
Malden, Massachusetts

PHILCO Model 49-602
Photofact Set No. 41, Folder No. 18

Complaint: Fades on AC, plays on battery.

Cause: Resistor #34B bad. All voltages measure normal.

Remedy: Replaced resistor 34B with one of correct value.

Carl C. Schmidt
Victor Radio & Video Service
2205 W. Aspen Street
Philadelphia 30, Pennsylvania

* * *

DUMONT Model RA-103D
Photofact Set No. 93, Folder No. 4

Complaint: Set would not light up. Fuse was good.

Cause: Safety interlock was found completely burned where one pin is riveted to the lug.

Remedy: Replacement of interlock and interlock cord restored normal operation. Sometimes the lugs on these safety interlock sockets are not tight enough, and with a load on them, heat will be generated, resulting in the whole thing burning up.

RCA Model T100
Photofact Set No. 93, Folder No. 9

Complaint: Normal raster and sound, but no picture.

Cause: C53 was shorted, raising the picture tube control grid voltage to about 85 volts.

Remedy: Replace C53.

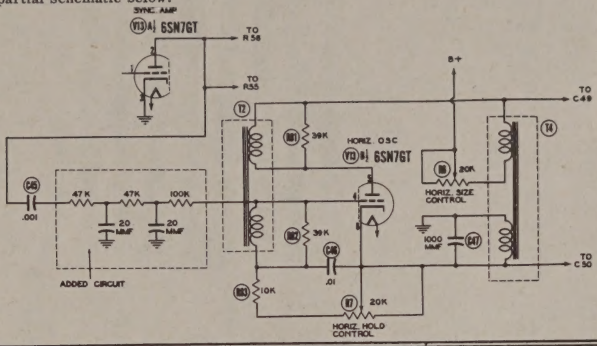
Editor's Note: Both above Experiences were submitted by:

Paul Boller
Boller's Television and Radio Service
311 West Main Street
Springfield, Ohio

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2, SET 59.

ADMIRAL
CHASSIS 19A1

In some locations, especially in low signal strength areas, vertical objects or lines may appear jagged or broken in the picture. This is caused by noise pulses triggering the horizontal oscillator resulting in displacement of horizontal lines. This can be corrected by inserting a noise filter between the sync amp. V13A and the horizontal oscillator. On those chassis not having this production change incorporated, this filter may be installed in the field. All parts, except C45 must be mounted on a tie strip which can best be mounted under the chassis between the vertical oscillator transformer T3 and V5. The lead dress and placement of a few small parts will need be changed to mount the tie strip. C45 should then be connected between pin 2 of V13A and the terminal. strip. C45 is changed from 50MMF to .001 and three resistors and two capacitors are added as shown in the partial schematic below.



SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 5, SET 103

AUTOMATIC MODELS
TV-1205, TV-1294

Series "B"

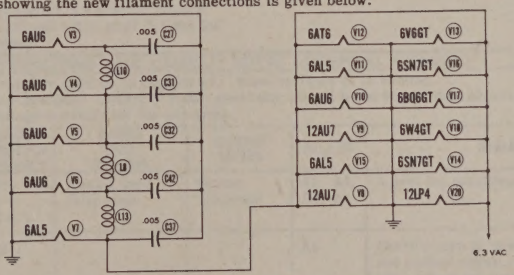
The series "B" chassis is identical to that used in model TV-1249 with the exception that all tube filaments are connected in parallel. This necessitated a change in some of the tube types. The new tube types are listed below:

	ORIGINAL TUBE TYPE	SERIES "B"
V13	25L6GT	6V6GT
V14	12SN7GT	6SN7GT
V16	12SN7GT	6SN7GT
V17	25BQ6GT	6BQ6GT
V18	25W4GT	6W4GT

C79 changed from 250MMF to 500MMF.

The 10K resistor shunting L17 changed to 15K.

A partial schematic showing the new filament connections is given below.



SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 7, SET 93

MOTOROLA MODELS
12VK15 (Ch. TS-30, A)
16VF8, 16VK7 (Ch. TS-16, A)

TS-30, A	A .1MFD capacitor has been added from pin 8 of V21 to ground.
TS-16, A, TS-30, A	A 1 Meg. resistor has been added between pin 8 of V11 and pin 3 of test socket. The low end of R38 has been removed from the AGC line and connected to ground. C58 and R39 in the cathode circuit of the 1st Video Amplifier V8 have been removed and the cathode is connected to ground.
	The connection from pin 6 of V11 to junction of C5 and R57 is an error. The connection should be from pin 6 of V11 to pin 3 of the same tube. Also the value of the brightness control R2 is shown as 40K on the schematic. The value should be 25K as it is given in parts list.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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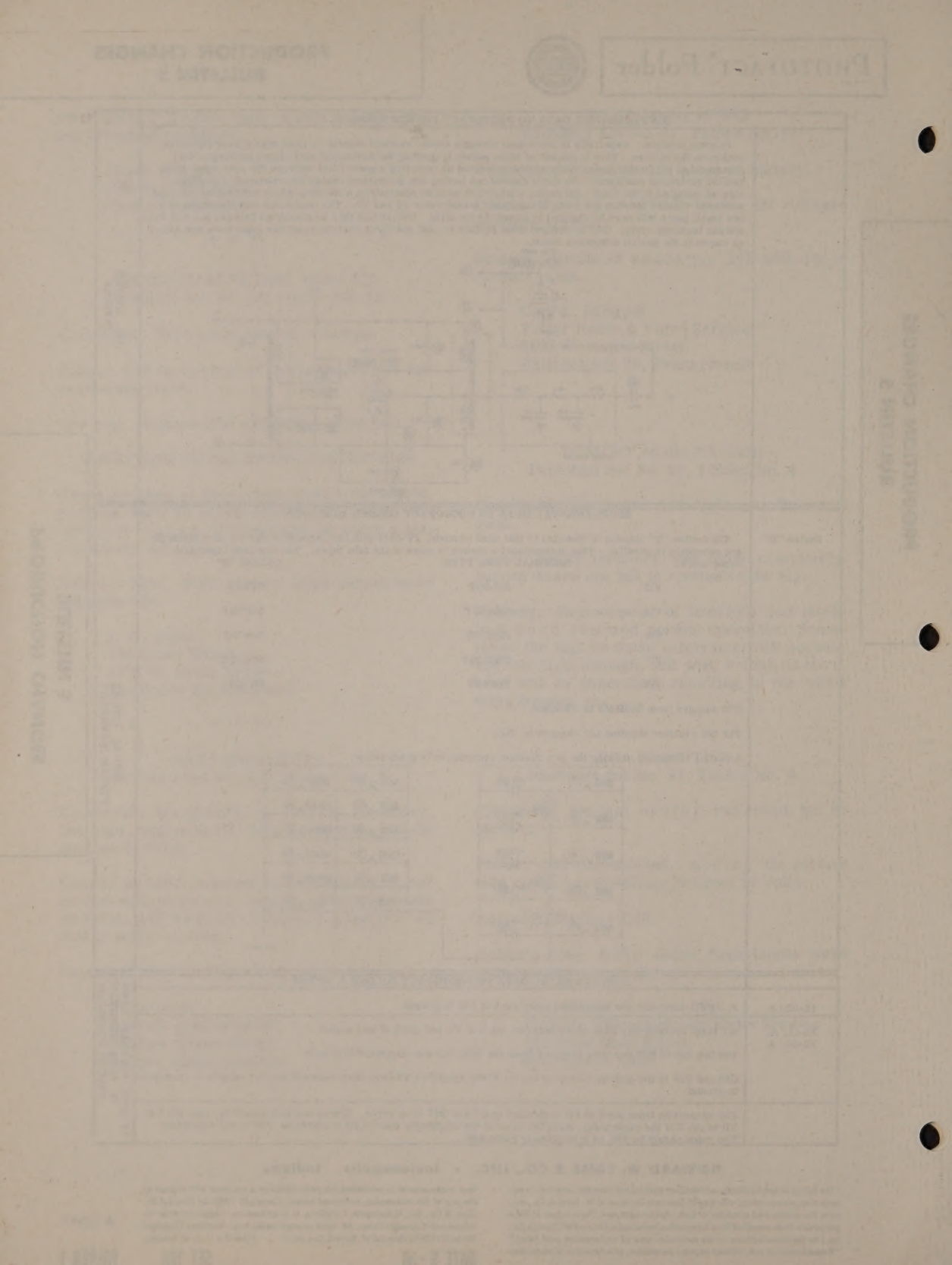
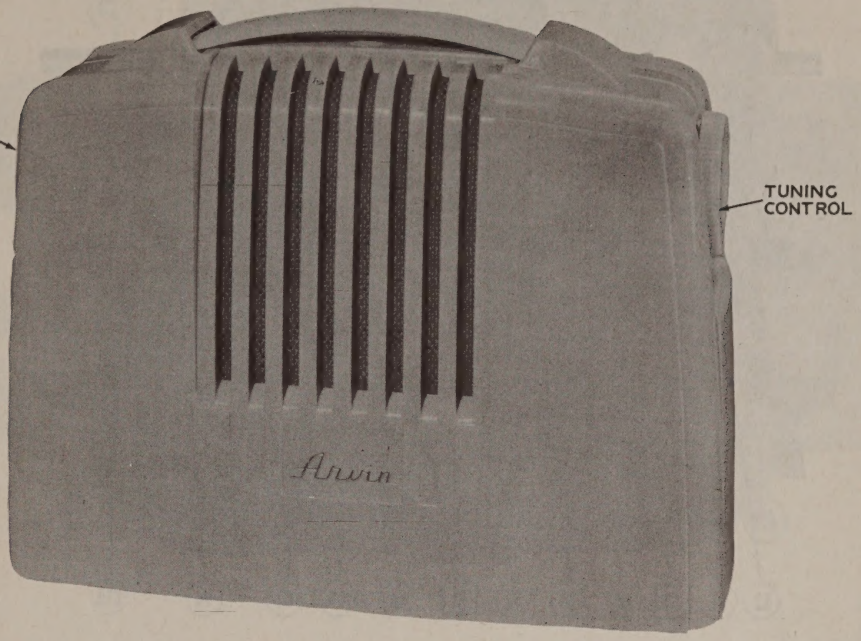


ARVIN MODEL 446P (Ch. RE-280)
(BATTERY OPERATED)



ARVIN MODEL 446P (Ch. RE-280)
(BATTERY OPERATED)

ARVIN MODEL 446P

TRADE NAME	Arvin, Model 446P (Ch. RE-280)
MANUFACTURER	Noblitt-Sparks Industries, Columbus, Indiana
TYPE SET	Battery Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types 1R5 Converter, 1T4 IF Amp., 1U5 DET-AVC-AF, 3S4 Power Output
POWER SUPPLY	1.5 Volts "A" Supply and 67.5 Volts "B" Supply
RATING	250MA at 1.5 Volts DC and 13MA at 67.5 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 6 (Grid) of 1R5 (V1). Low side to chassis.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1600KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output.	"	A6	"

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 1, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

ARVIN MODEL 446P

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1T4	1T4	6AR	
V3	DET-AVC-AF	1U5	1U5	6BW	
V4	Power Output	3S4	3S4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	10	150	A21811	PRS150/12		BR1015		TVA-1304	RF Bypass
C2	50	500	C20065	1468-00005	D6-500	5W5Q5	GP1K-50	1FM-45	Osc. Grid Cap.
C3	.05	200	C20067-503	P288-05	DF-503	PTE4S5		TM-15-2	AVC Filter
C4	.05	200	C20067-503	P288-05	DF-503	PTE4S5		TM-15-2	RF Bypass
C5	50	500	C20065-500	1468-00005	D6-500	5W5Q5	GP1K-50	1FM-45	Diode RF Filter
C6	.002	600	C20069-202	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Audio Coupling
C7	.01	400	C20067-103	P488-01	D6-103	PTE4S1	811-01	TM-11	AF Amp. Screen
C8	100	500	C20065-101	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	AF Amp. Plate
C9	.006	600	C20068-602	P688-006	D6-562	PTE6D6	811-005	TM-26	Audio Coupling
C10	.001	600	C20069-102	P688-001	D6-102	PTE6D1	GP2L-001	TM-21	Output Plate

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2 Meg.	½	C23138	Q13-139	AG-66-Z	B-76-S	Volume control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-2	SWB-2	Not Req.	Attach to R1A per instructions

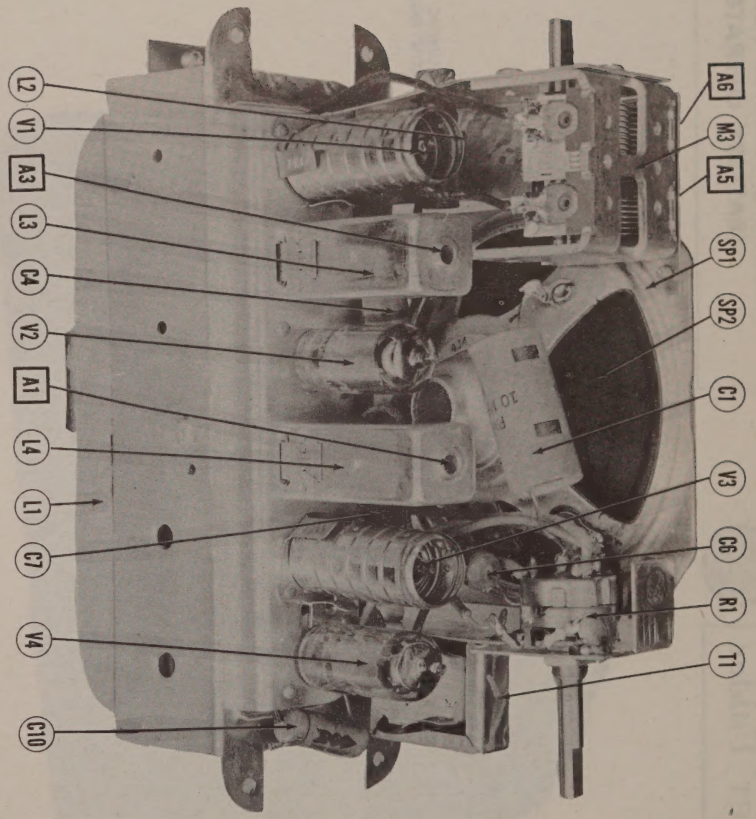
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ARVIN PART No.	IRC PART No.	IDENTIFICATION CODES
R2	100KΩ	½	C20060-104	BTS-100K	Osc. Grid
R3	2.2 Meg.	½	C20060-225	BTS-2.2 Meg.	AVC Network
R4	10 Meg.	½	C20060-106	BTS-10 Meg.	AF Amp. Grid
R5	4.7 Meg.	½	C20060-475	BTS-4.7 Meg.	AF Amp. Screen
R6	1 Meg.	½	C20060-105	BTS-1 Meg.	AF Amp. Plate
R7	2.2 Meg.	½	C20060-225	BTS-2.2 Meg.	Output Grid
R8	390Ω	½	C20120-391	BTS-390	Isolation

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	7600Ω	4Ω	220Ω	.4Ω	AC23140	A-3329 ①	A-2927 ①		① Bend mounting tabs down.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA ARVIN PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.				
SP1	PM	4Ω	C22972			
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ARVIN PART No.	REPLACEMENT DATA MEISSNER PART No.	
L1	Loop Ant.	3.4Ω		C-23141		
L2	Osc. Coil	1.9Ω	7.8Ω	AC-23139	14-1074	
L3	1st IF	22Ω	20Ω	C-21797-1S	16-6668	
L4	2nd IF	22Ω	20Ω	C-21797-1S	16-6669	

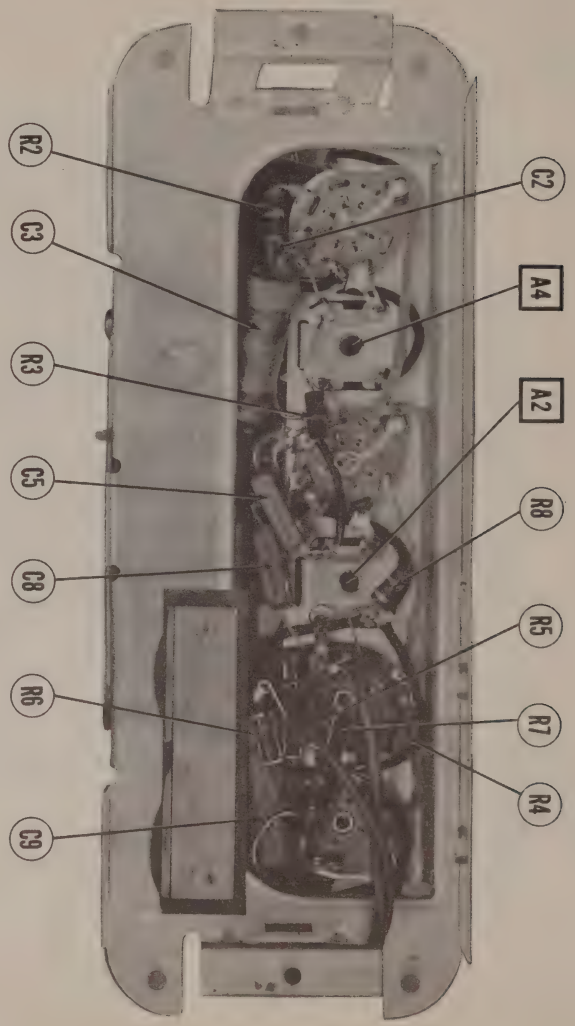
BATTERIES

ITEM No.	VOLTAGE	ARVIN PART No.	REPLACEMENT DATA EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M1	1.5V "A"		950			2R			2 used in parallel.
M2	67.5V "B"			467			XX45		

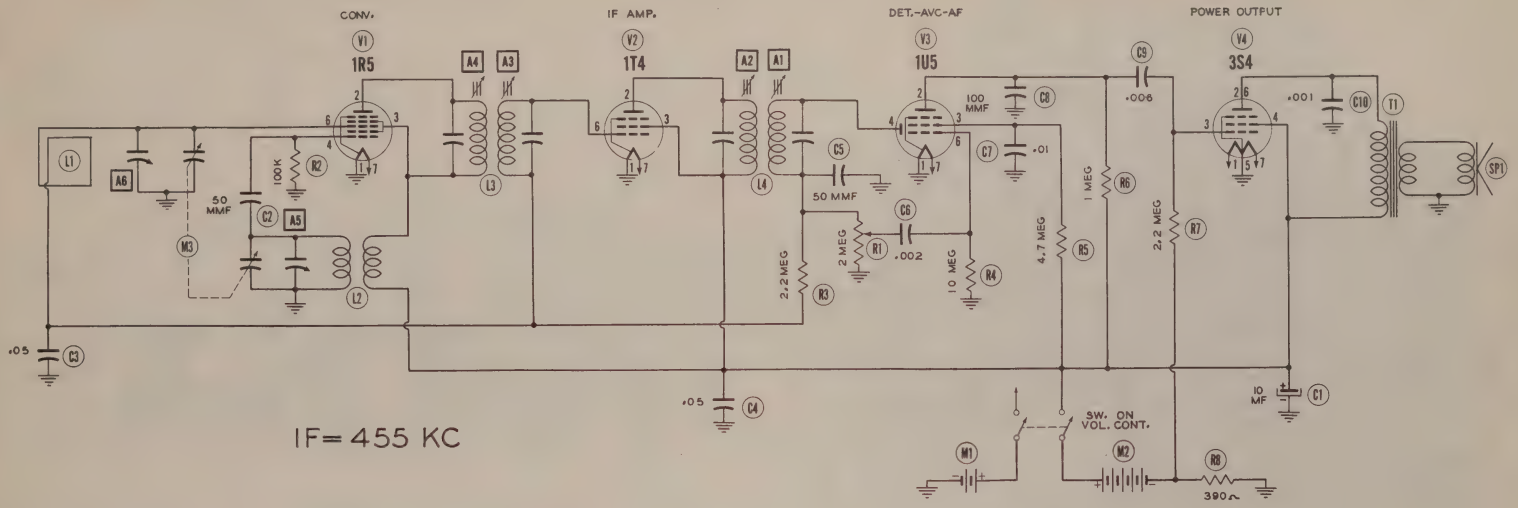
MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M3	2 Gang Var. Cap.	C22966	(15-391MMF, 16-162MMF)
	Knob	C23167	Volume
	Knob	C23166	Tuning
	Cabinet	AA23759-1	Maroon
	Cabinet	AA23759-2	Sandal wood

CHASSIS—BOTTOM VIEW



ARVIN MODEL 446P



IF= 455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0V.	60VDC	60VDC	§-18VDC	0V.	0V.	1.4VDC
V 2	1T4	0V.	60VDC	60VDC	0V.	0V.	0V.	1.4VDC
V 3	1U5	0V.	7.4VDC	3VDC	-.1VDC	0V.	0V.	1.4VDC
V 4	3S4	1.4VDC	55VDC	0V.	60VDC	0V.	55VDC	1.4VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†22Ω	†1.9Ω	100KΩ	*	4.2 Meg.	*
V 2	1T4	*	†22Ω	†0Ω	Inf.	*	4.2 Meg.	*
V 3	1U5	*	†1 Meg.	†4.7 Meg.	2 Meg.	390Ω	10 Meg.	*
V 4	3S4	*	†220Ω	2.2 Meg.	†0Ω	*	†220Ω	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM PIN 4 OF V4.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

CORONADO MODEL

94TV6-43-8953A

IMPORTANT FILING NOTICE

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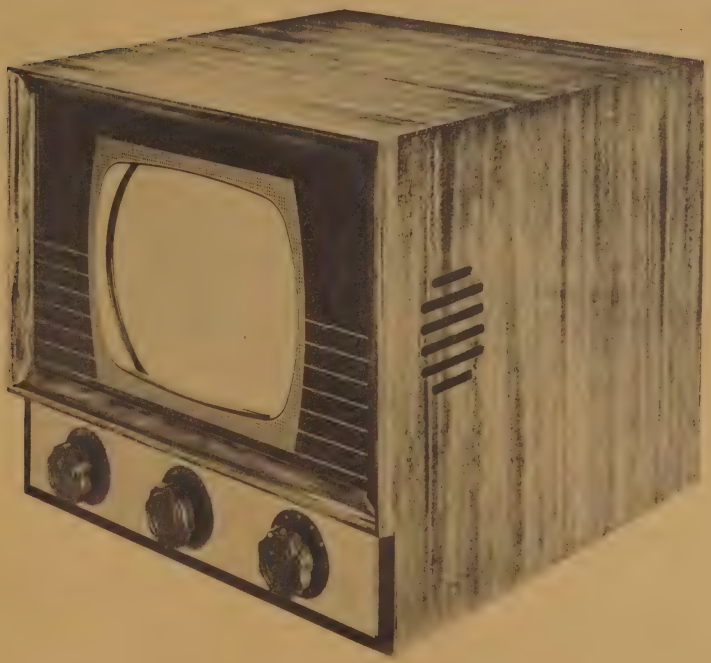

94TV6-43-8953A

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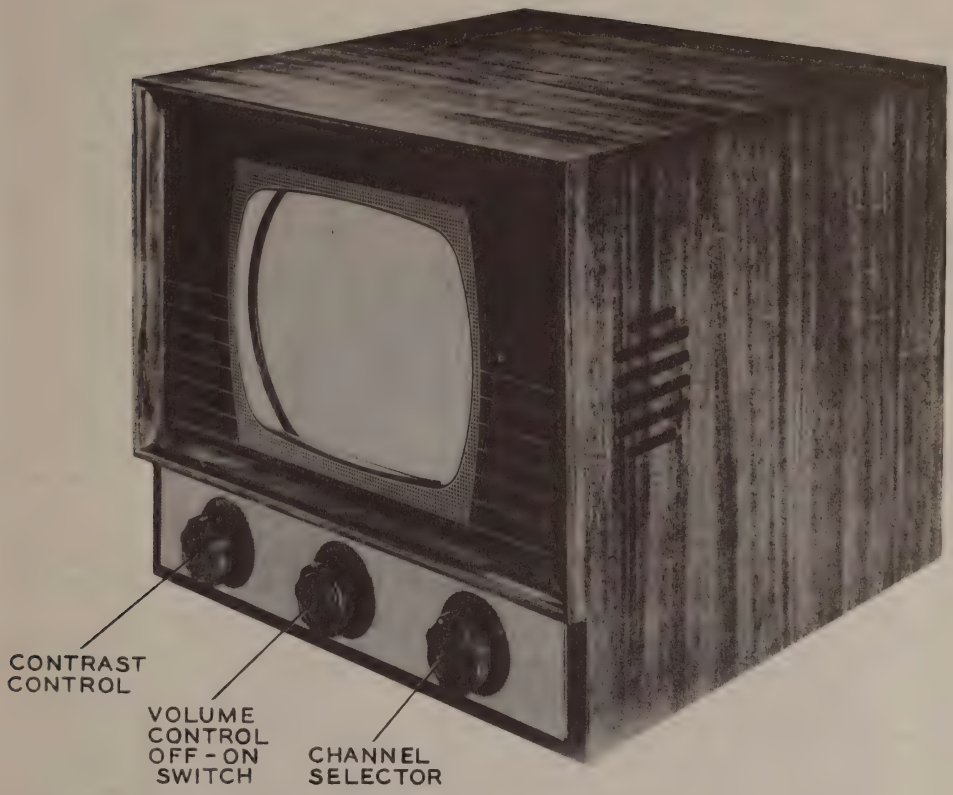

CORONADO MODEL
94TV6-43-8953A

TRADE NAME	Coronado, Model 94TV6 - 43 - 8953A
MANUFACTURER	Gamble - Skogmo Inc., 15 North 8th St., Minneapolis, Minn.
TYPE SET	Televison Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC-60 Cycle
TUNING RANGE	Channels 2 thru 13
RATING	1.7 Amp. at 117 Volts AC

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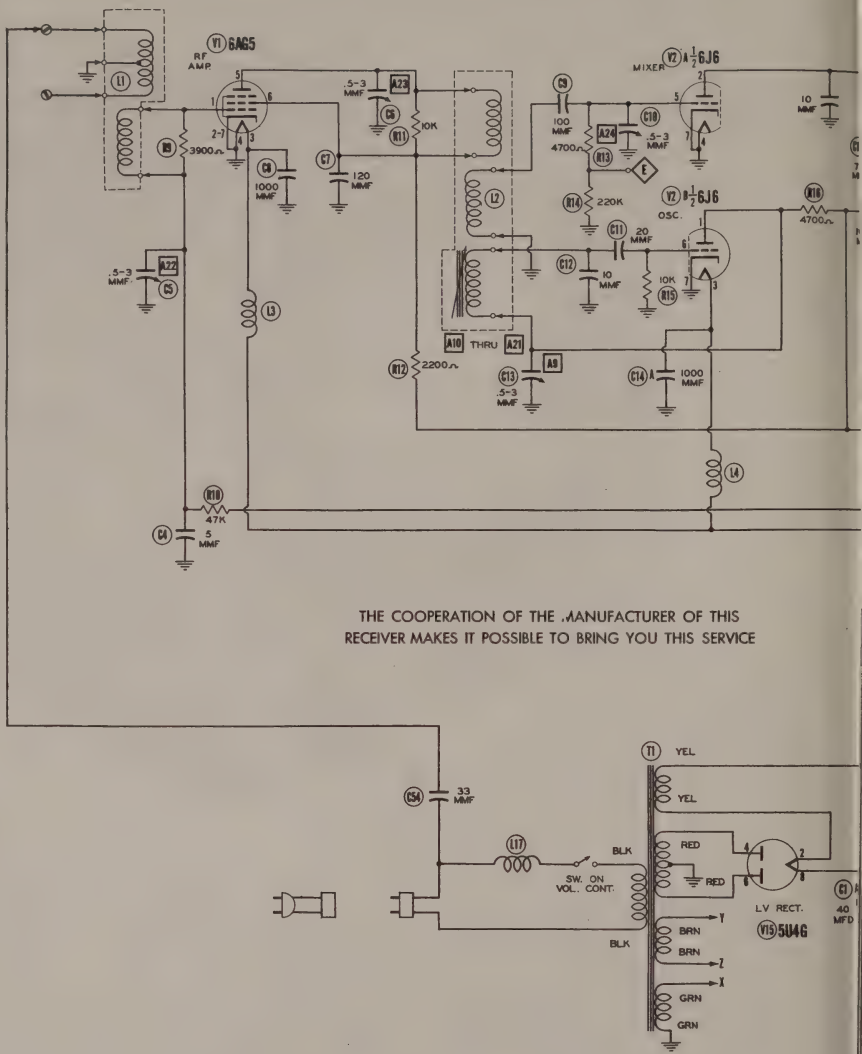

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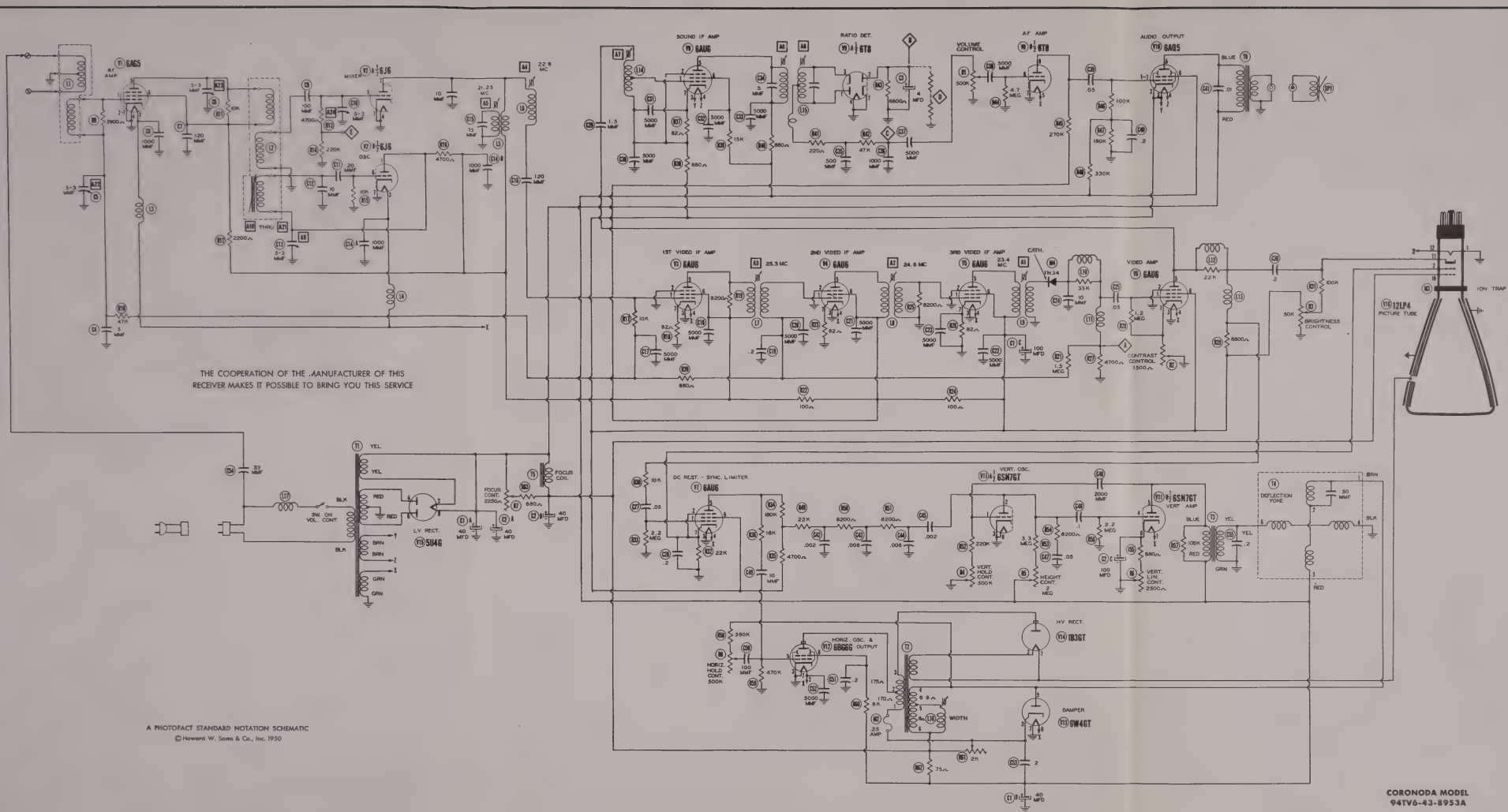
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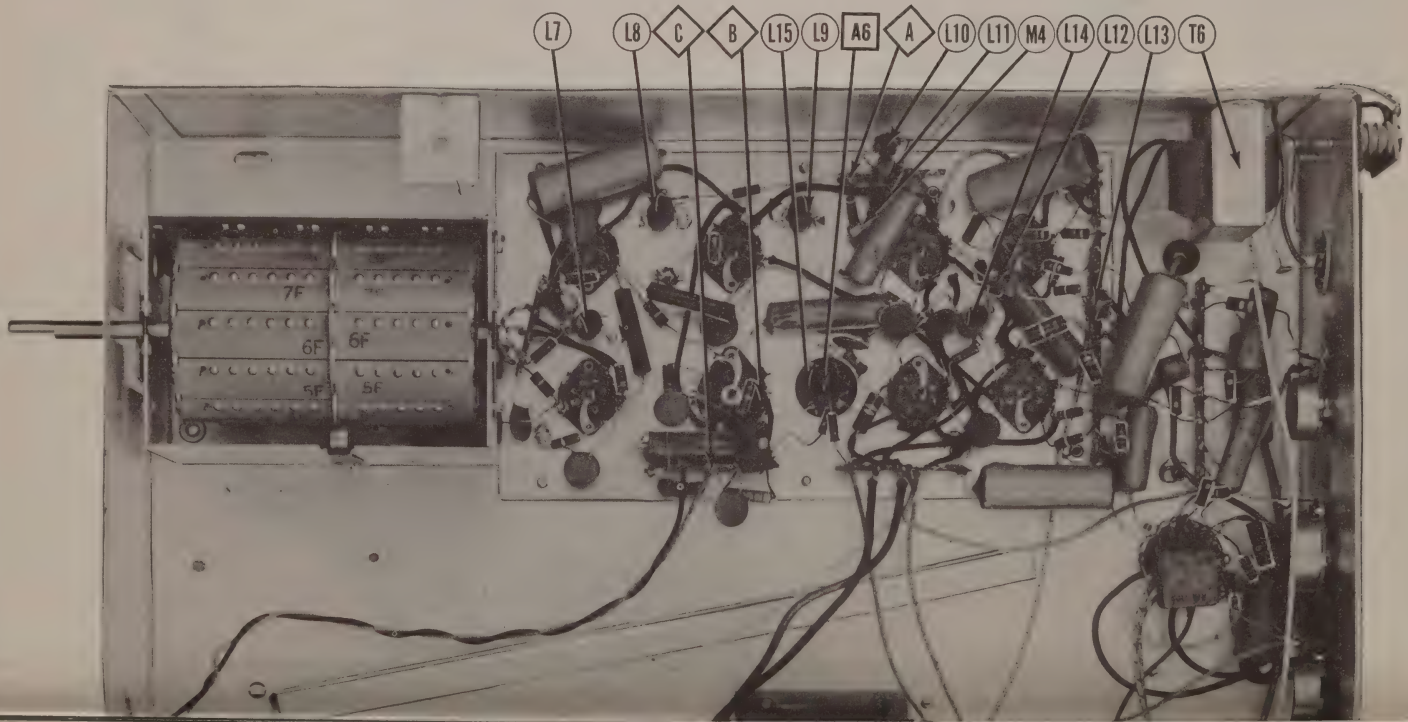
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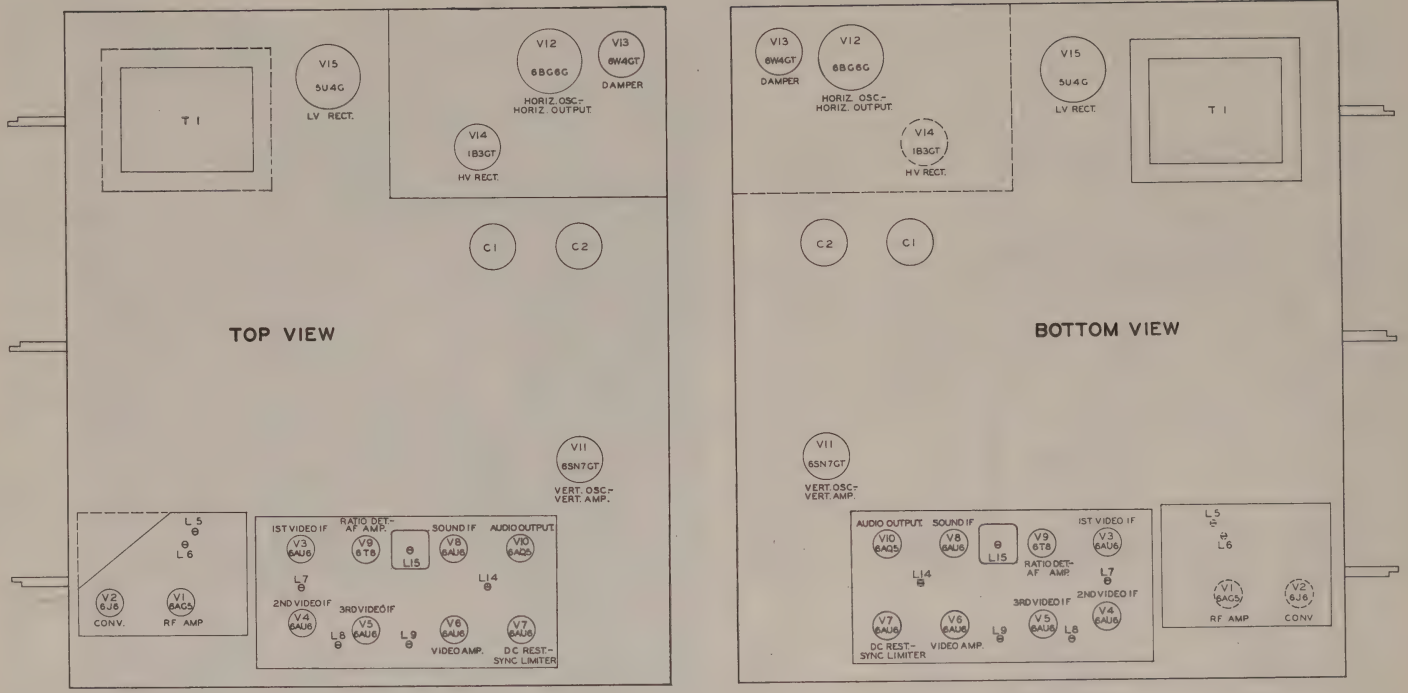


TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and dressed away from chassis.

VIDEO IF ALIGNMENT

Remove converter tube (V2) from its socket, and replace with a 6J6 which has had pin 1 removed to prevent erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	23.4MC (10MC SWP)	Any	DC Probe to Point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	Direct	"	24.5MC	"	"	A2	"
3.	Direct	"	25.3MC	"	"	A3	"
4.	Direct	"	22.8MC	"	"	A4	"
5.	Direct	"	21.25MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC SWP)	21.25MC 25.75MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve as shown in figure 1. If necessary slightly retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from point B to chassis. The junction of these two resistors is alignment point D as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V6). Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe to Point (B). Common to chassis.	A6, A7	Adjust for maximum deflection.
8.	.01MFD	"	"	"	DC Probe to Point (C). Common to Point (D).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V6). Low side to chassis.	4.5MC (450KC Sweep)	4.5MC	Any	Vert. Amp. to Point (B). Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C3. Adjust for maximum amplitude and symmetry as per figure 2.
10.	.01MFD	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A8	Reconnect capcitor C3. Adjust A8 to place 4.5MC at center of crossover lines per Fig 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove dummy converter tube and replace with original 6J6 in its socket.
The overall oscillator circuit adjustment (A9) should be adjusted only in case any individual channel oscillator adjustment shows insufficient range. If A9 is adjusted ALL channels will require realignment.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon res.	Across antenna terminals with 120Ω resistor in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (A). Low side to chassis.	A10	Adjust to place sound marker in "notch" as shown in figure 4. The video marker should be at 50%.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A11	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A12	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A13	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A14	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A15	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A16	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A17	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A18	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A19	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A20	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A21	

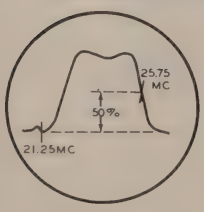


FIG. 1

FIG. 2

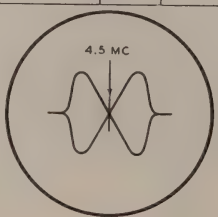


FIG. 3

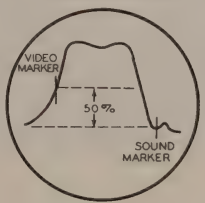


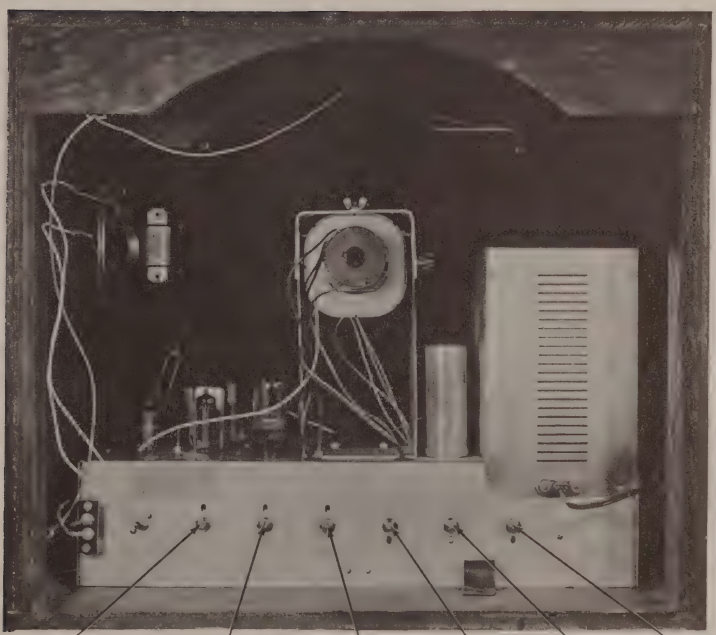
FIG. 4

RF ALIGNMENT

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. to Point (E) thru 10KΩ. Low side to chassis.	A22, A23, A24	Adjust for response curve similar to figure 5 with markers above 80%.
13.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check for response curve similar to figure 5. If markers fall below 70% on any channel make slight adjustment of A22, A23 and A24 with channel selector switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

FIG. 5



CABINET-REAR VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.2VDC	0V.	6.3VAC	0V.	105VDC	105VDC	0V.		
V 2	6J6	80VDC	125VDC	6.3VAC	0V.	-.9VDC	§-3.5VDC	0V.		
V 3	6AU6	-.1VDC	0V.	0V.	6.3VAC	125VDC	125VDC	.7VDC		
V 4	6AU6	-.1VDC	0V.	0V.	6.3VAC	125VDC	125VDC	.5VDC		
V 5	6AU6	0V.	0V.	0V.	6.3VAC	130VDC	130VDC	.8VDC		
V 6	6AU6	.4VDC	0V.	0V.	6.3VAC	90VDC	130VDC	15VDC		
V 7	6AU6	-.1VDC	4.4VDC	0V.	6.3VAC	115VDC	130VDC	5VDC		
V 8	6AU6	▲8.6VDC	▲8.6VDC	▲0V.	▲6.3VAC	▲215VDC	▲145VDC	▲10VDC		
V 9	6T8	-.1VDC	-.8VDC	-.4VDC	0V.	6.3VAC	0V.	0V.	-.3VDC	55VDC
V 10	6AQ5	▲-7.4VDC	▲0V.	▲0V.	▲6.3VAC	▲240VDC	▲220VDC	▲-7.4VDC		
V 11	6SN7GT	-30VDC	65VDC	0V.	.2VDC	360VDC	14VDC	6.3VAC	0V.	TOP CAP *
V 12	6BG6G	120VDC	6.3VAC	0V.	370VDC	-.2VDC	320VDC	0V.	230VDC	
V 13	6W4GT	0V.	0V.	430VDC	430VDC	370VDC	0V.	0V.	6.3VAC	
V 14	1B3GT	* DO NOT MEASURE.								
V 15	5U4G	0V.	400VDC	0V.	380VAC	0V.	380VAC	0V.	400VDC	
V 16	12LP4	0V.	5VDC	PIN 10 360VDC	PIN 11 0V. 130VDC	PIN 12 6.3VAC				

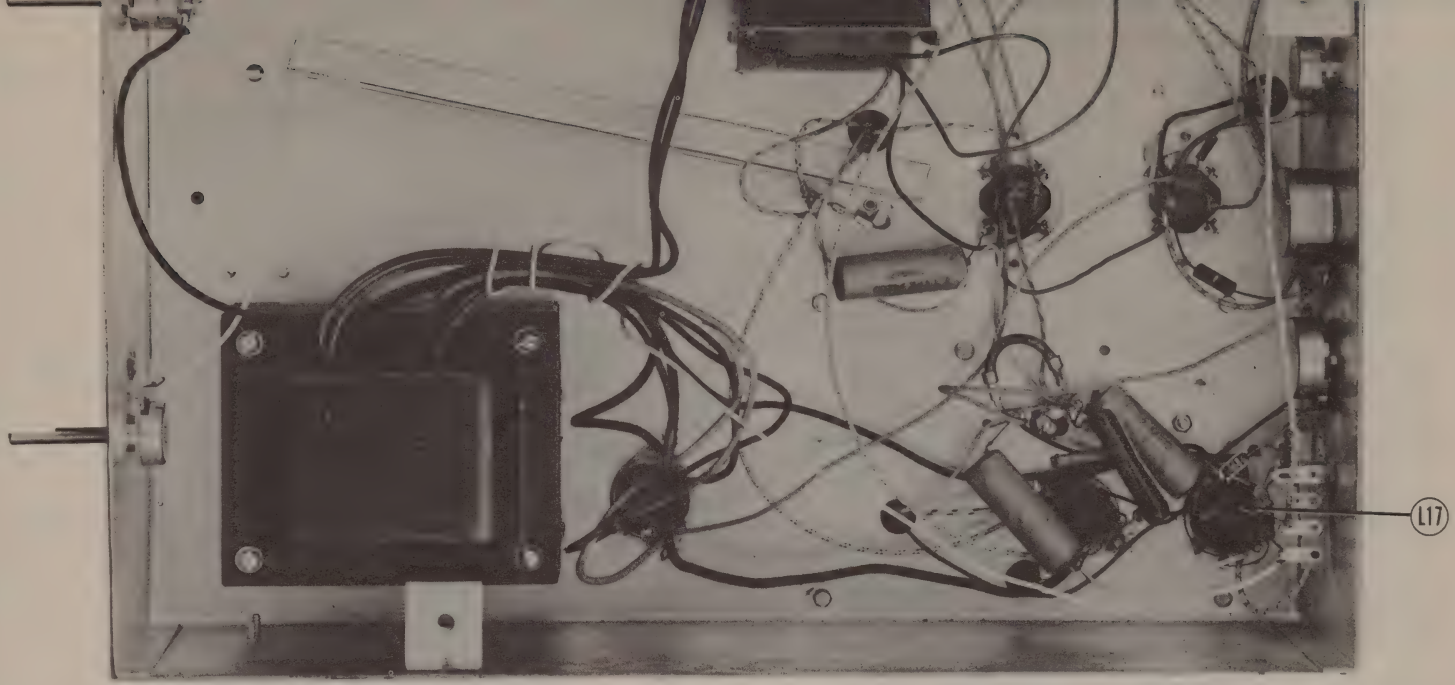
§ TAKEN WITH VACUUM TUBE VOLTMETER.
▲ MEASURED FROM PIN 2 OF V10.

RESISTANCE READINGS

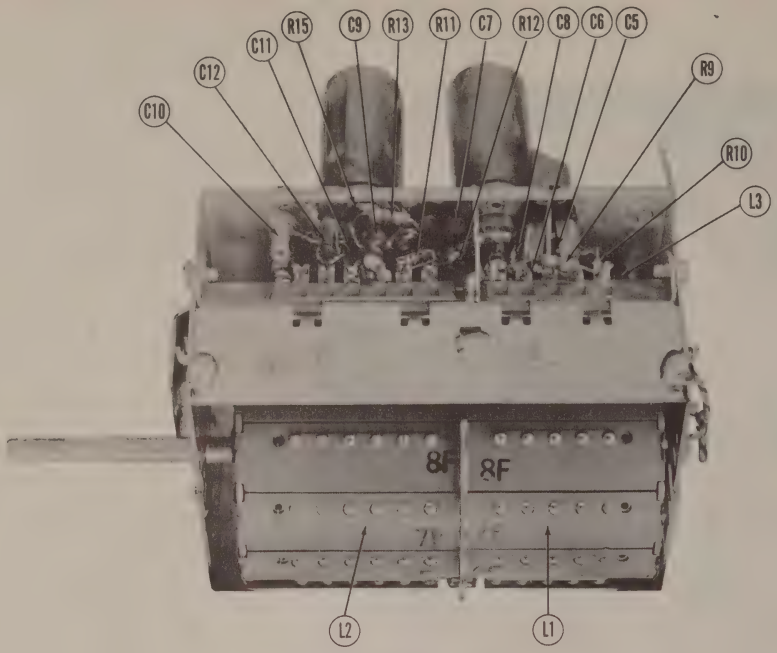
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	1.5 Meg.	0Ω	.1Ω	0Ω	▲2.4KΩ	▲2.4KΩ	0Ω		
V 2	6J6	▲5KΩ	▲200Ω	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AU6	1.5 Meg.	0Ω	0Ω	.1Ω	▲200Ω	▲200Ω	82Ω		
V 4	6AU6	1.5 Meg.	0Ω	0Ω	.1Ω	▲100Ω	▲100Ω	82Ω		
V 5	6AU6	.2Ω	0Ω	0Ω	.1Ω	▲.2Ω	▲0Ω	82Ω		
V 6	6AU6	1.2 Meg.	0Ω	0Ω	.1Ω	▲6.8KΩ	▲0Ω	1.5KΩ		
V 7	6AU6	2.2 Meg.	22KΩ	0Ω	.1Ω	▲185KΩ	▲0Ω	22KΩ		
V 8	6AU6	▲680Ω	▲680Ω	▲0Ω	▲.1Ω	†960Ω	†15KΩ	▲700Ω		
V 9	6T8	Inf.	6.8KΩ	Inf.	0Ω	.1Ω	Inf.	0Ω	4.7 Meg.	▲270KΩ
V 10	6AQ5	†250KΩ	▲0Ω	▲0Ω	.1Ω	†385Ω	†300Ω	†250KΩ		
V 11	6SN7GT	220KΩ 720KΩ	†3.2 Meg. †5.2Meg.	0Ω	2.2 Meg.	†900Ω	3KΩ 680Ω	.1Ω	0Ω	
V 12	6BG6G	0Ω	.1Ω	0Ω	†250Ω	470KΩ	†400KΩ †900KΩ	0Ω	†8KΩ	TOP CAP †1.8KΩ
V 13	6W4GT	Inf.	Inf.	†1.5KΩ	†1.5KΩ	†200Ω	Inf.	0Ω	.1Ω	
V 14	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †2KΩ
V 15	5U4G	Inf.	150KΩ	Inf.	46Ω	Inf.	46Ω	Inf.	150KΩ	
V 16	12LP4	0Ω	22KΩ	PIN 10 †200Ω	PIN 11 150KΩ 100KΩ	PIN 12 .1Ω				

▲ MEASURED FROM PIN 2 OF V10.
† MEASURED FROM PIN 8 OF V15.

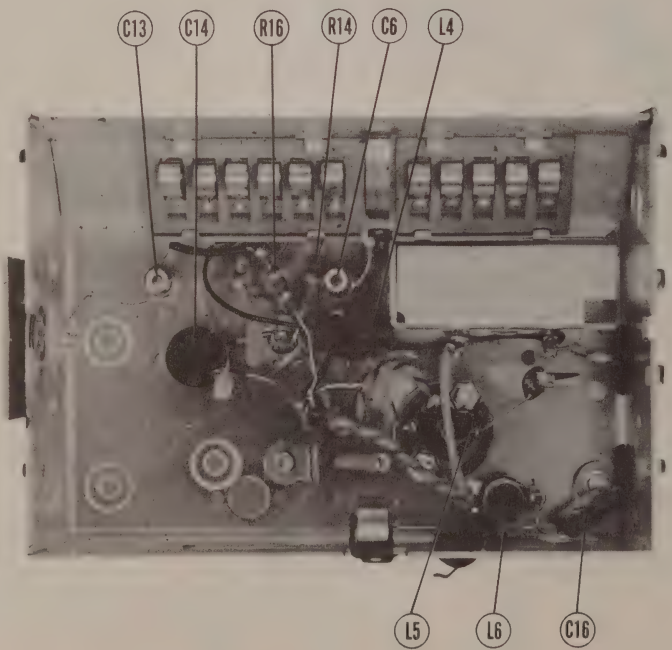
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



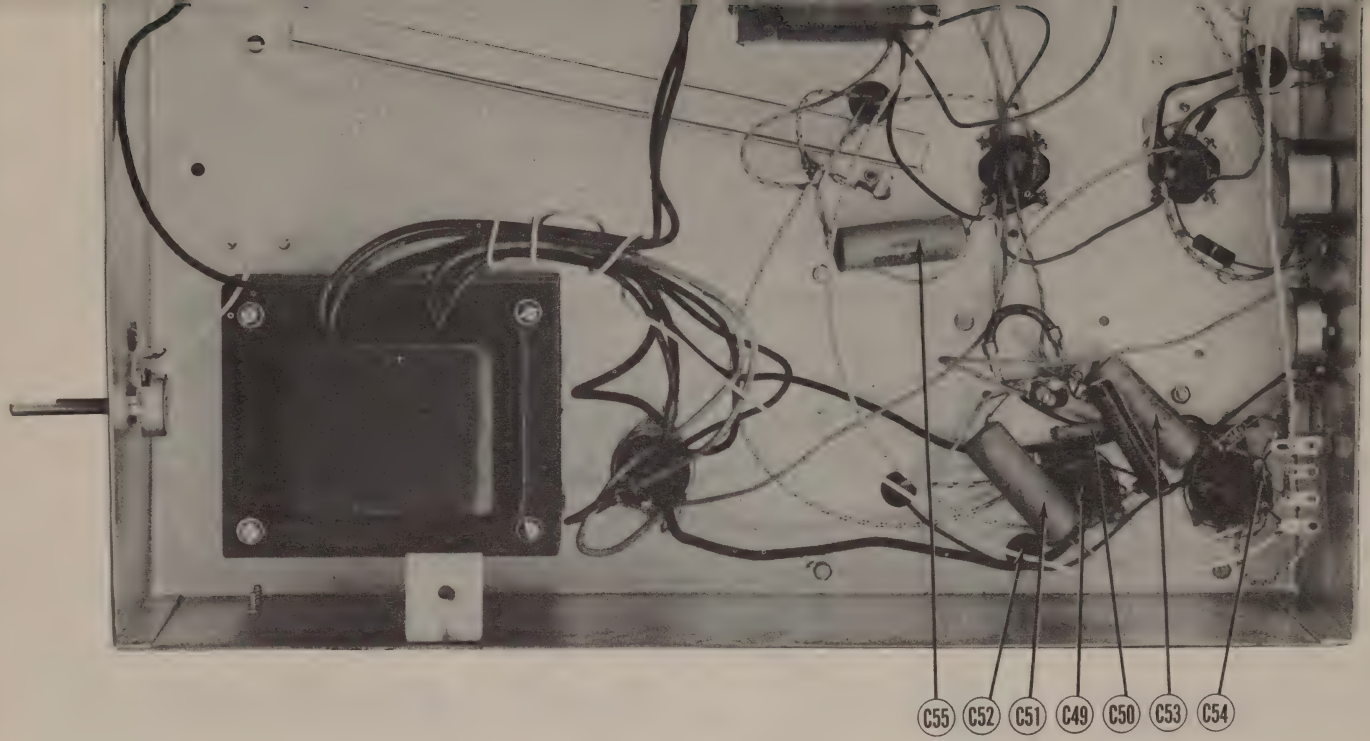
CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6AU6	6AU6	7BK	
V4	2nd Video IF	6AU6	6AU6	7BK	
V5	3rd Video IF	6AU6	6AU6	7BK	
V6	Video Amp.	6AU6	6AU6	7BK	
V7	DC Rest. -Sync. Limiter	6AU6	6AU6	7BK	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Det. -AF Amp.	6T8	6T8	9E	
V10	Audio Output	6AQ5	6AQ5	7BQ	
V11	Vert. Osc. -Vert. Amp.	6SN7GT	6SN7GT	8BD	
V12	Hor. Osc. -Hor. Output	6BG6G	6BG6G	5BT	
V13	Damper	6W4GT	6W4GT	4CG	
V14	HV Rect.	1B3GT	1B3GT	3C	
V15	LV Rect.	5U4G	5U4G	5T	
V16	Picture Tube	12LP4	12LP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	18-295	AF88J20E		UP13CJ		TVL-308	▲ Filter
B	40	450				1192			■ Filter
C	100	200							▲ Decoupling
C2A	40	450	18-295	AF88J20E		UP13CJ		TVL-308	▲ Filter
B	40	450				1192			■ Filter
C	100	200							▲-Vert. Output Cath. Byp.
C3	4	50	18-292	PRS150/4		BR550		TVA-13	Stabilizing Cap.
C4	5		15-222	SI5DNPO	D2-4.7		NPOK-5		Fixed Trimmer *
C5	.5-3				829-3				Variable Trimmer
C6	.5-3				829-3				Variable Trimmer
C7	120			GP120K	D6-121		GP2K-120		RF Decoupling
C8	1000		15-220	GP1000M	D6-102		GP2L-001		RF Fil. Byp.
C9	100			SI100KN750	DN-100		N750L-100		RF Coupling
C10	.5-3				829-3				Variable Trimmer
C11	20			SI20KNPO	D2-20		NPOK-20		Osc. Grid Cap.
C12	10		15-223	SI10DN750	DN-10		N750K-10		Fixed Trimmer
C13	.5-3				829-3				Variable Trimmer
C14A	1000			GP1000M	D6-102		882-2 x 0015	29C7	Osc. Fil. Byp.
B	1000			GP1000M	D6-102				RF Bypass
C15	75			CN75JNPO	D2-75		NPOM-75		Fixed Trimmer
C16	120	300		GP120K	D6-121		GP2K-120		IF Coupling
C17	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	AGC Filter
C18	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	1st V. IF Decoupling
C19	.2	400	16-188	P488-22		GT4P2		TC-2	AGC Filter
C20	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	AGC Filter
C21	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	2nd V. IF Decoup.
C22	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	RF Bypass
C23	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	3rd V. IF Cath. Byp.
C24	10		15-223	GP10K	D6-100	5W5Q1	GP1K-10	MS-41	V. Diode Filter
C25	.05	400	16-189	P488-05		PTE4S5		TM-15	Video Coupling
C26	.2	400	16-188	P488-22		GT4P2		TC-2	Video Coupling
C27	.05	400	16-189	P488-05		PTE4S5		TM-15	Video Coupling
C28	.2	400	16-188	P488-22		GT4P2		TC-2	Sync. Limiter-DC Rest. Cath. Byp.
C29	1.5		15-224	CI1.5CNPO	D2-1.5		NPOK-1.5		S. IF Coupling
C30	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	S. IF Decoupling
C31	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	S. IF Cath. Byp.
C32	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	S. IF Screen Byp.
C33	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	S. IF Plate Dec.
C34	5		15-222	SI5DNPO	D2-4.7	5R5V5	NPOK-5	MS-55	Fixed Trimmer
C35	500	500	15-221	1468-0005	D6-501	5W5T5	GP2K-500	1FM-35	Diode Load Cap.
C36	1000		15-220	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	De-emphasis
C37	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	Audio Coupling
C38	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	Audio Coupling
C39	.05	400	16-189	P488-05		PTE4S5		TM-15	Audio Coupling
C40	.2	400	16-188	P488-22		GT4P2		TC-2	Bias Filter
C41	.01	600	16-201	P688-01	D6-103	PTE6S1	811-01	TM-11	Output Plate Byp.
C42	.002	600	16-198	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Integrator Net.
C43	.006	600	16-209	P688-006	D6-562	PTE6D6		TM-26	Integrator Net.
C44	.006	600	16-209	P688-006	D6-562	PTE6D6		TM-26	Integrator Net.
C45	.002	600	16-198	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Vert. Sync. Coupling
C46	2000	800	15-219						Vert. Feedback
C47	.05	600	16-193	P688-05		PTE6S5		TM-15	Vert. Discharge
C48	.1	600	16-208	P688-1		PTE6P1		TM-1	Vert. Sweep Coupling
C49	10		15-223	GP10K	D6-100	5W5Q1	GP1K-10	1FM-41	Hor. Sync. Coupling
C50	100		15-225	CN100JN030	D2-100	5R5T1	NPOM-100	MS-31	Hor. Feedback
C51	.2	400	16-188	P488-22		GT4P2		TC-2	Hor. Output Screen Byp.
C52	5000		16-177	BPD-5	D6-502	1D5D5	811-005	29C1	Hor. Output Fil. Byp.
C53	.2	400	16-188	P488-22		GT4P2		TC-2	Hor. Sweep Coup.
C54	33		15-210	GP33K	D6-330	5W5Q4	GP1K-33	1FM-44	Ant. Coupling
C55	.2	400	16-188	P488-22		GT4P2		TC-2	Fixed Trimmer

* Not used in all models.

C

ITEM No.	RATING: RESIST-ANCE	RATING: WATTS	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: IRC PART No.	C
R1A	500KΩ	1/2	24-184	Q13-133	M
B	Switch		Not Req.	76-1	SV
R2	1500Ω	1/2	25-12		
R3A	50KΩ	1/2	25-10	Q11-123	M
B	Shaft		Not Req.	Not Req.	N
R4A	500KΩ	1/2	25-11	Q11-133	M
B	Shaft		Not Req.	Not Req.	N
R5A	2 Meg.	1/2	25-15	Q11-139	M
B	Shaft		Not Req.	Not Req.	N
R6A	2500Ω	1/2	25-13	Q11-112	M
B	Shaft		Not Req.	Not Req.	N
R7	2250Ω	2	25-14	W-3000	43
R8A	500KΩ	1/2	25-11	Q11-133	M
B	Shaft		Not Req.	Not Req.	N

R

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: IRC PART N
R9	3900Ω	1/2		BTS-3900
R10	47KΩ 20%	1/2		BTS-47K
R11	10KΩ	1/2		BTS-10K
R12	2200Ω 20%	1/2		BTS-2200
R13	4700Ω	1/2		BTS-4700
R14	220KΩ 20%	1/2		BTS-220K
R15	10KΩ	1/2		BTS-100K
R16	4700Ω	1/2		BTS-4700
R17	10KΩ 20%	1/2	60-760	
R18	82Ω	1/2	60-776	
R19	8200Ω 5%	1/2	60-778	
R20	680Ω 20%	1/2	60-790	BTS-680
R21	1.5 Meg. 20%	1/2	60-780	BTS-1.5 M
R22	100Ω	1	60-743	BW-1-100
R23	82Ω	1	60-776	
R24	100Ω	1	60-743	BW-1-100
R25	8200Ω 5%	1	60-778	
R26	82Ω	1	60-776	
R27	4700Ω	1	60-759	BTS-4700
R28	1.2 Meg.	1	60-782	BTS-1.2 M
R29	6800Ω	1	60-785	BTA-6800
R30	10KΩ	1	60-760	BTS-10K
R31	100KΩ	1	60-727	BTS-100K
R32	22KΩ	1	60-744	BTS-22K
R33	2.2 Meg. 20%	1	60-726	BTS-2.2 M
R34	180KΩ	1	60-784	BTS-180K
R35	4700Ω	1	60-759	BTS-4700
R36	18KΩ	1	60-777	BTS-18K
R37	82Ω	1	60-776	
R38	680Ω 20%	1	60-790	BTS-680
R39	15KΩ	1	60-783	
R40	680Ω 20%	1	60-790	BTS-680
R41	220Ω	1	60-753	
R42	47KΩ	1	60-730	BTS-47K
R43	6800Ω	1	60-786	BTS-6800
R44	4.7 Meg.	1	60-779	BTS-4.7 M
R45	270KΩ 20%	1	60-747	BTS-270K
R46	100KΩ 20%	1	60-727	BTS-100K
R47	180KΩ 5%	1	60-784	BTS-180K
R48	330KΩ 5%	1	60-787	BTS-330K
R49	22KΩ	1/2	60-744	BTS-22K
R50	8200Ω 5%	1/2	60-778	BTS-8200
R51	8200Ω 5%	1/2	60-778	BTS-8200
R52	220KΩ	1/2	60-672	BTS-220K
R53	3.3 Meg. 20%	1/2	60-761	BTS-3.3
R54	8200Ω 5%	1/2	60-778	BTS-8200
R55	680Ω 20%	1/2	60-708	BTS-680
R56	2.2 Meg. 20%	1	60-726	BTA-2.2
R57	100KΩ	1/2	60-727	BTS-100K
R58	390KΩ	1/2	60-781	BTS-390K
R59	470KΩ 20%	1/2	60-731	BTS-470K
R60	8000Ω	10	60-793	AB-8000
R61	2000Ω	20	60-795	DHA-2000
R62	75Ω	1		
R63	680Ω	1	60-797	BTA-680

Note. Some models use 68Ω resistor in this applicat

TRANSFO

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	CORO PAR
T1	117VAC ② 1.7A	740VCT .200ADC	5VAC ③ 3A	6.3VAC ② .72A SEC. 4 6.3VAC ② 6A	80-2

① Drill new mounting holes.
③ Use for SEC. 3

DESCRIPTIONS

TROLS

TAT No.	CENTRALAB PART No.	INSTALLATION NOTES
	B-60-S	Volume control
	Not Req.	Attach to R1A per instructions Contrast control
	AN-31	Brightness control
.	AK-1	Attach to R3A per instructions
	AN-59	Vert. hold control
.	AK-1	Attach to R4A per instructions
	AN-75	Height control
.	AK-1	Attach to R5A per instructions
	AN-7	Vert. linearity control
q.	AK-1	Attach to R6A per instructions
	V-131	Focus control-Wire Wound
	AN-59	Horiz. hold control
.	AK-1	Attach to R8A per instructions

STORS

IDENTIFICATION CODES

ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED

Ant. Coil Shunt
AGC Network
RF Plate Coil Shunt
RF Decoupling
Conv. Grid
Conv. Grid
Osc. Grid
Osc. Plate
1st Video IF Grid
1st Video IF Cathode
2nd Video IF Transformer Shunt
AGC Network
AGC Network

Decoupling-Wire Wound
2nd Video IF Cathode
Decoupling-Wire Wound
3rd Video IF Transformer Shunt
3rd Video IF Cathode
Video Det. Load
Video Amp. Grid
Video Amp. Plate
Isolation
Voltage Divider
Picture Tube Grid
Sync. Limiter Grid

Sync. Limiter Plate
Sync. Limiter Plate
Isolation
Sound IF Cathode
Voltage Divider
Sound IF Screen
Sound IF Plate Decoupling
Balancing
De-emphasis
Ratio Det. Diode Load
AF Amp. Grid
AF Amp. Plate
Output Grid
Voltage Divider
Voltage Divider
Integrator Network
Integrator Network
Integrator Network
Vert. Osc. Grid
Vert. Osc. Plate

Vert. Peaking
Vert. Amp. Cathode
Vert. Amp. Grid

Vert. Output Transformer Shunt
Feedback
Horiz. Output Grid
Horiz. Output Screen-Wire Wound
Damper Filter-Adjustable-Wire Wound
Filter-Wire Wound-See Note
Focus Coil Shunt

art No. 60-789.

ER (POWER)

	REPLACEMENT DATA		
	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
	P-8153 ①	P-2955 ① P-2944 ③	TP-355 ①

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA CORONADO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	345Ω Tap ⓐ 170Ω	9.5Ω Tap ⓐ .6Ω SEC. 2 EΩ	80-252	A-8128	HVO-3	TFB-2	Hor. Output Trans.
T3	590Ω	6.8Ω	80-255	A-8116	A-3035 ①	TSO-1 ①	Vert. Output Trans.
T4A	10Ω		83-650	DY-1	MD-1		Hor. Deflection Coil
B	65Ω						Vert. Deflection Coil
T5	263Ω		10-549	FC-10	MF-1		Focus Coil

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA CORONADO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	6KΩ	4.4Ω	385Ω	.6Ω	80-253	A-3877 ②	A-3019	RO-9	② Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA CORONADO PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	PM	4.4Ω	79-377	ST-110 MOD. P6-V	6A15	
	CONE DIA.	V. C. DIA.				
SP2	5 7/8"	9/16"				

COILS (RF-IF)

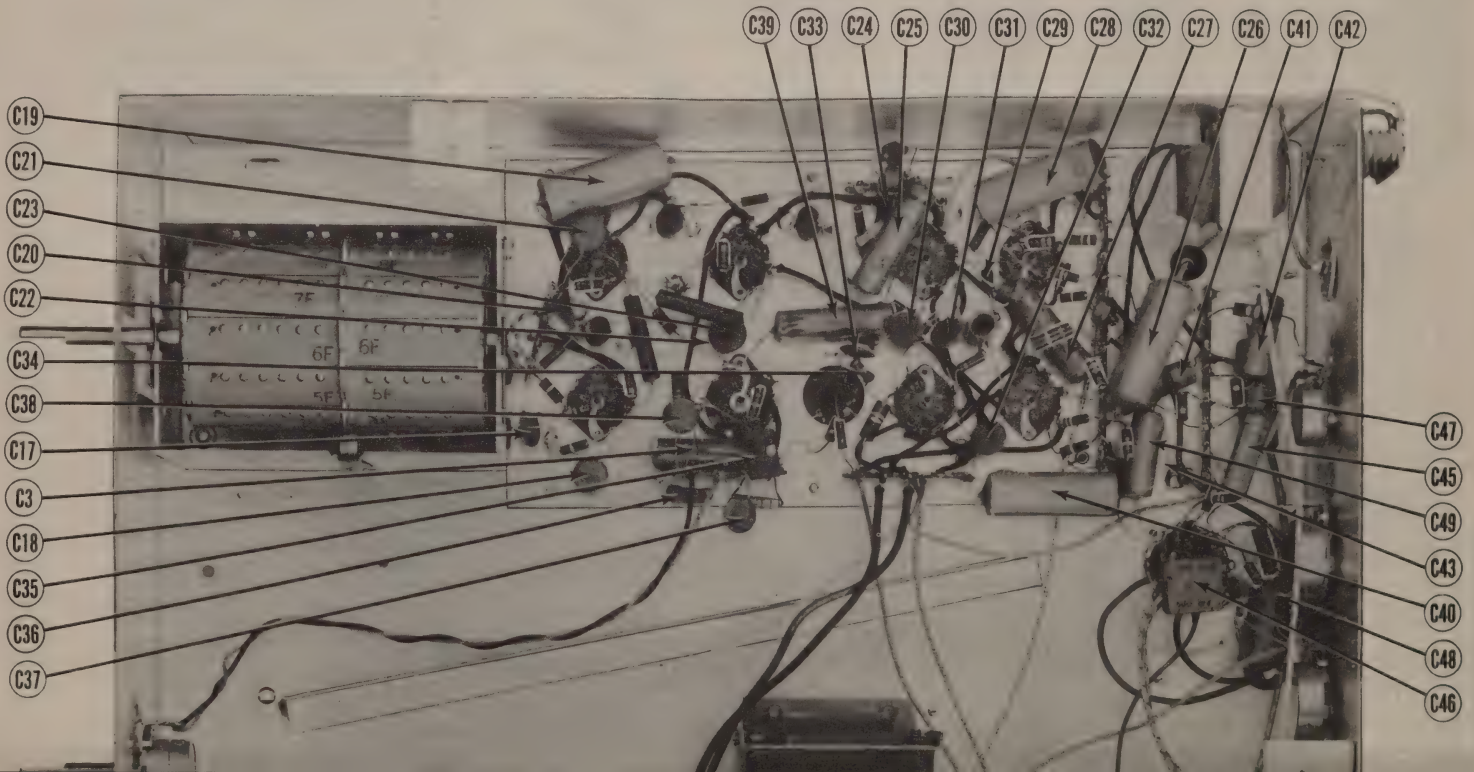
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CORONADO PART No.	MEISSNER PART No.	NOTES
L1	Ant. Coil	0Ω				
L2	RF, Mixer Grid & Osc.					
L3	Fil. Choke	0Ω				
L4	Fil. Choke	0Ω				
L5	Sound Trap	2Ω	0Ω			
L6	1st Video IF	1.5Ω				
L7	2nd Video IF	.2Ω	.2Ω	10-541		
L8	3rd Video IF	.2Ω	.2Ω	10-542		
L9	4th Video IF	.2Ω	.2Ω	10-543		
L10	Peaking	10Ω			19-1921 †	170 microhenries Wound on 33KΩ resistor
L11	Peaking	16.5Ω			19-1923	400 microhenries
L12	Peaking	13.2Ω			19-1922 *	280 microhenries Wound on 23KΩ resistor
L13	Peaking	17Ω			19-1923	400 microhenries
L14	Sound IF	11.8Ω		10-544		Tap at 7.9Ω
L15	Ratio Det. Trans.	4.2Ω	.2Ω	10-552		
L16	Horiz. Size	.3Ω		10-551		
L17	Ant. Chk.	.1Ω		10-550		

† Parallel with 33KΩ resistor
* Parallel with 23KΩ resistor

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M1	RF Tuner	95-19	
M2	Fuse	43-11	.25A 250V Type 3AG
M3	Ion Trap	83-651	
M4	Crystal	48-45	1N34 Video Detector

CORONADO MODEL 94TV6-43-8953A


C39
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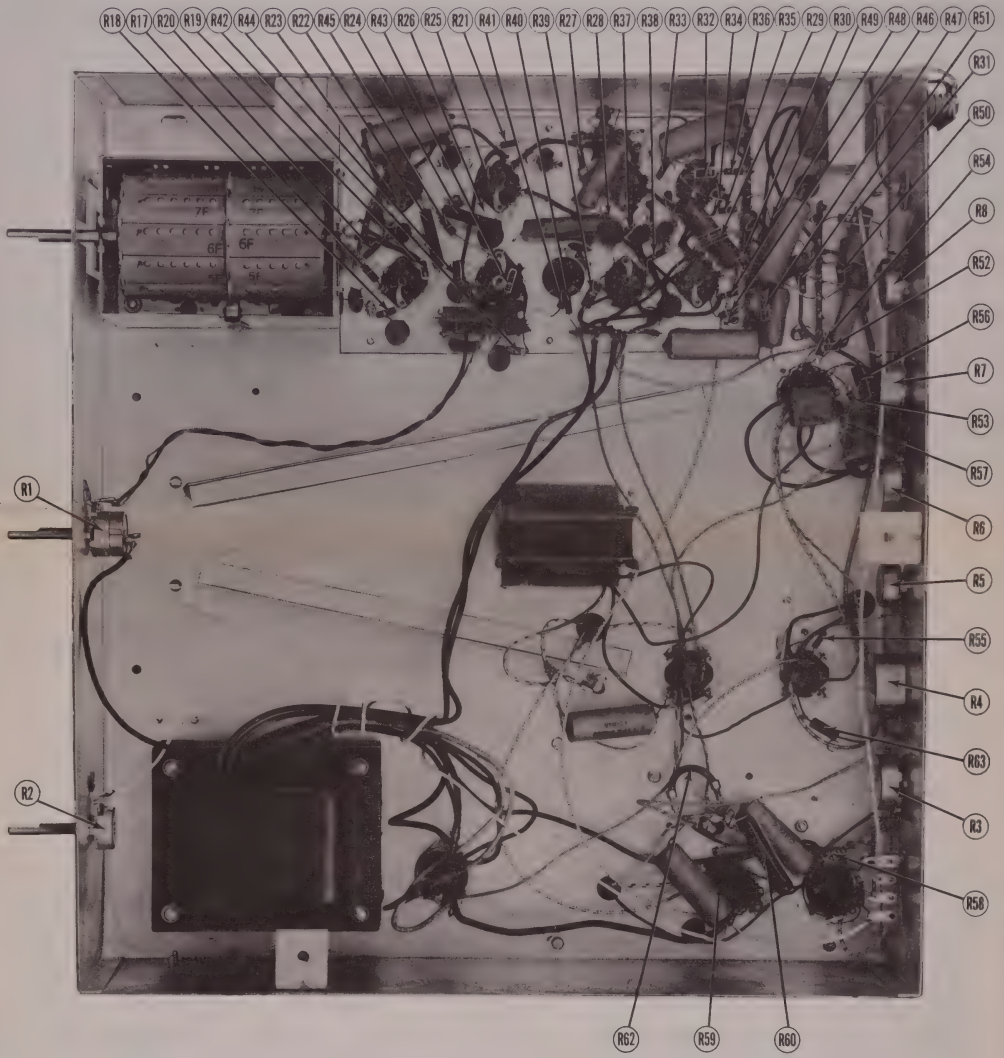

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PHOTOFACT* Folder

CROSLEY MODEL
10-421MU

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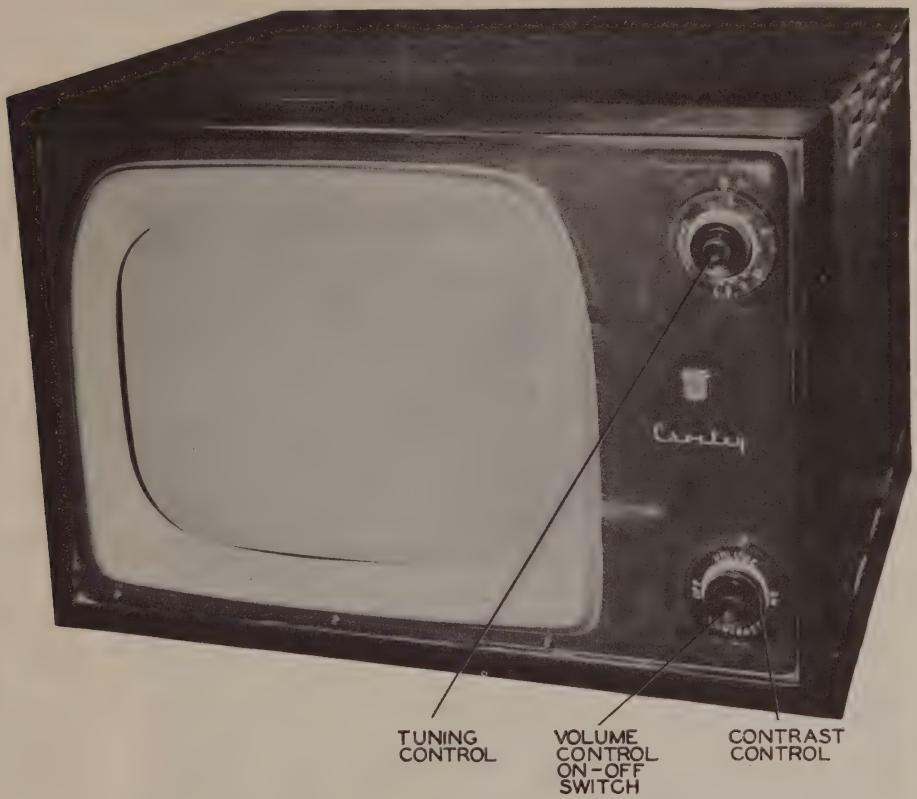

CROSLEY
MODEL 10-421MU

TRADE NAME	Crosley Model 10-421
MANUFACTURER	Crosley Corp., 1329 Arlington St., Cincinnati, Ohio
TYPE SET	Television Receiver
TUBES	Twenty Five
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.8 Amp. at 117 Volts AC
TUNING RANGE	44-216MC (Continuous Tuning)

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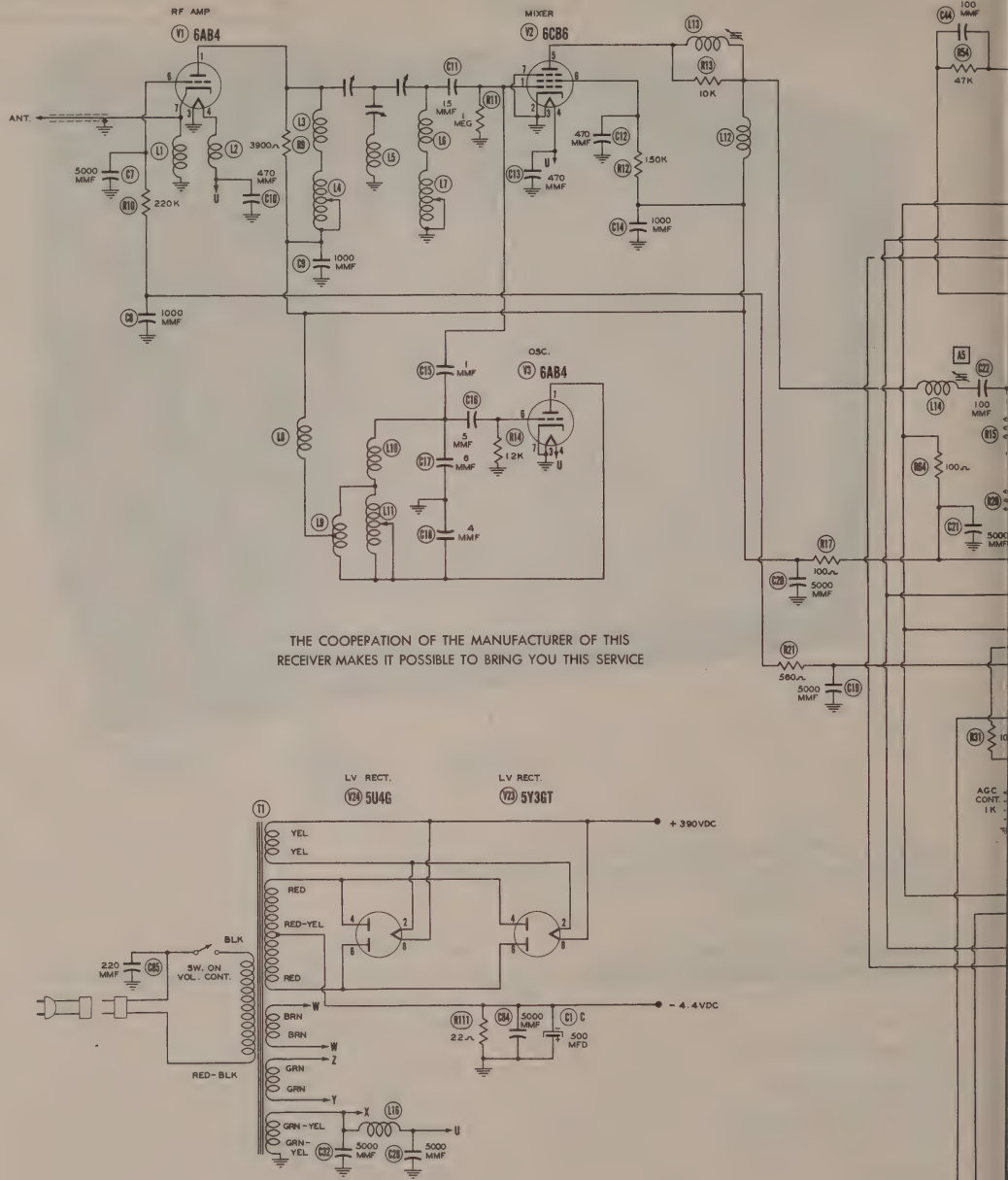

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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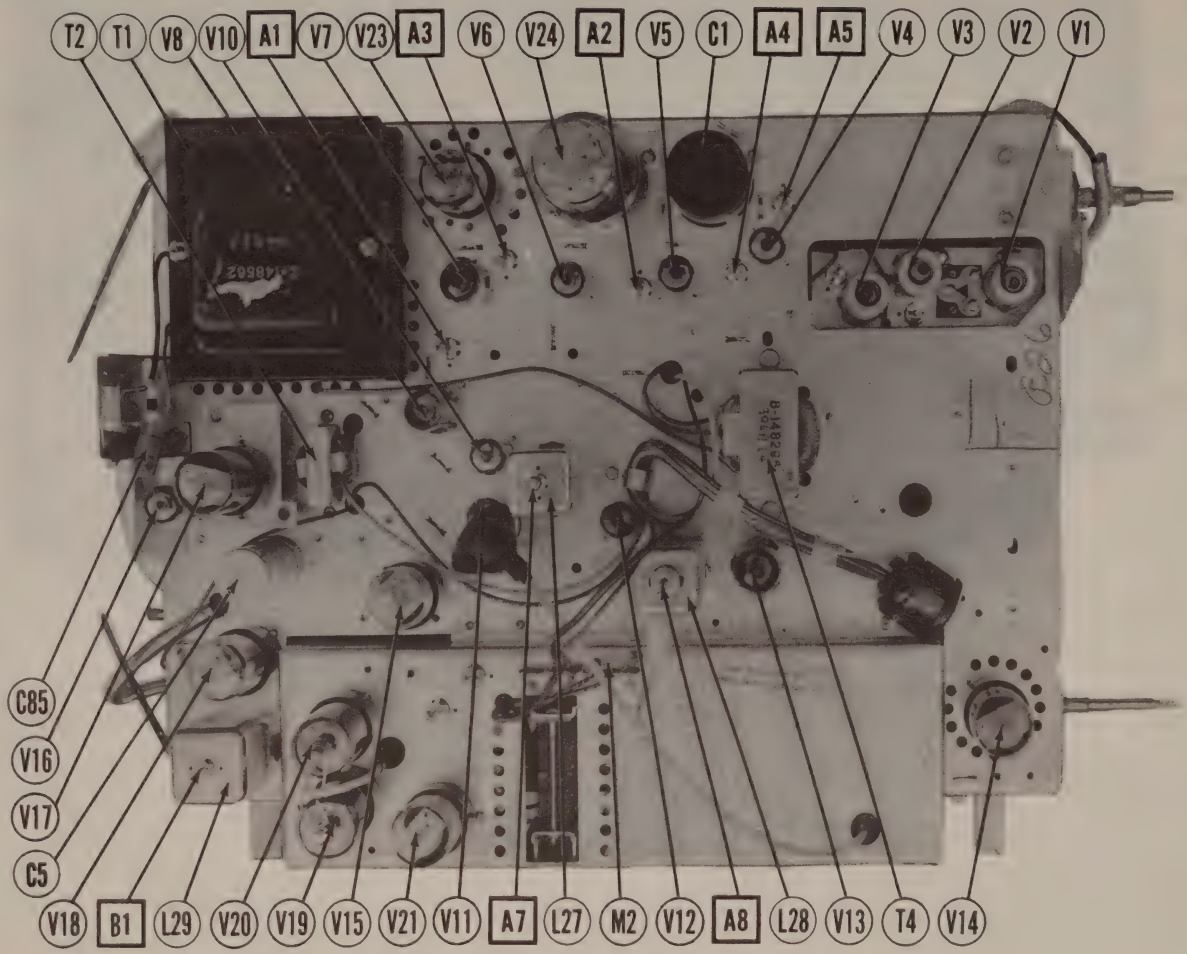
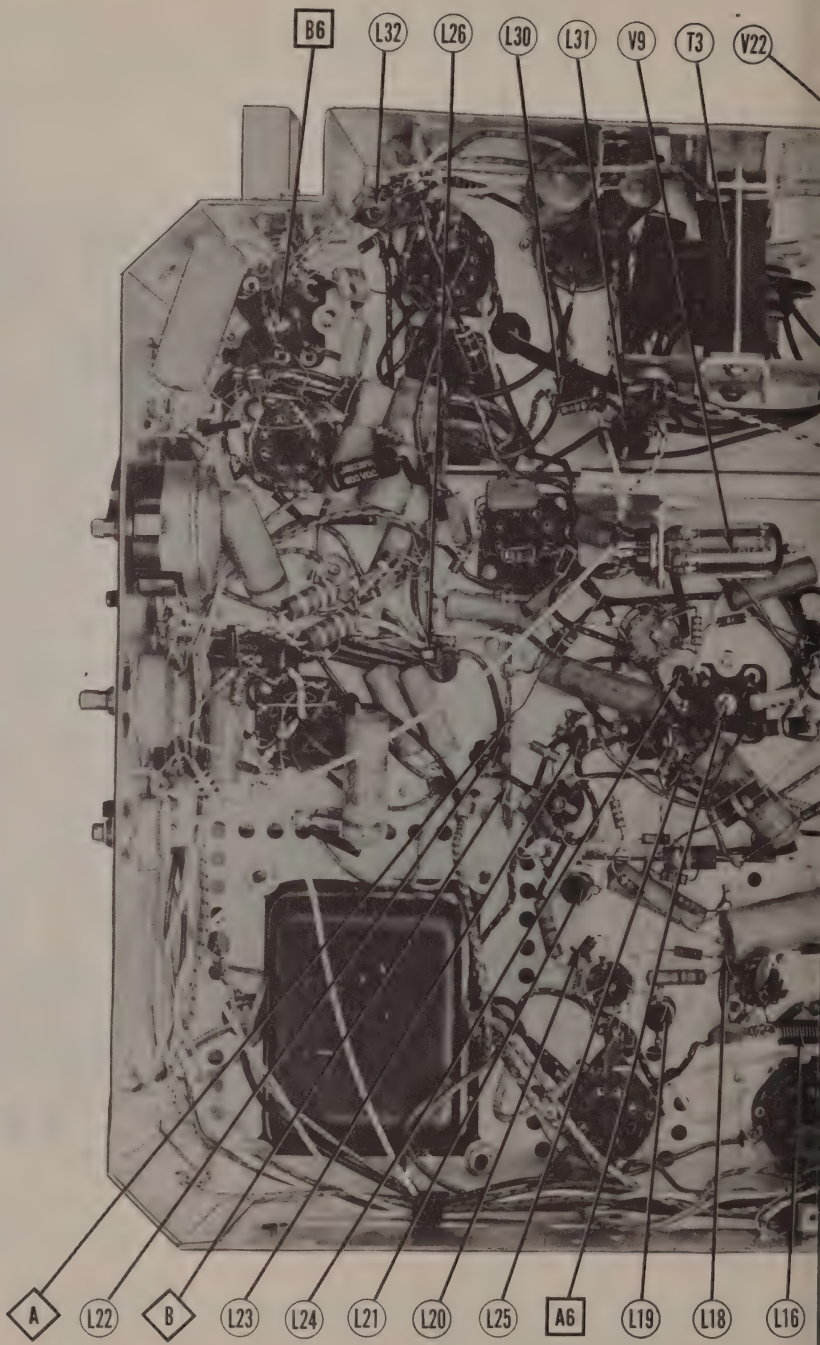


CHASSIS TOP VIEW



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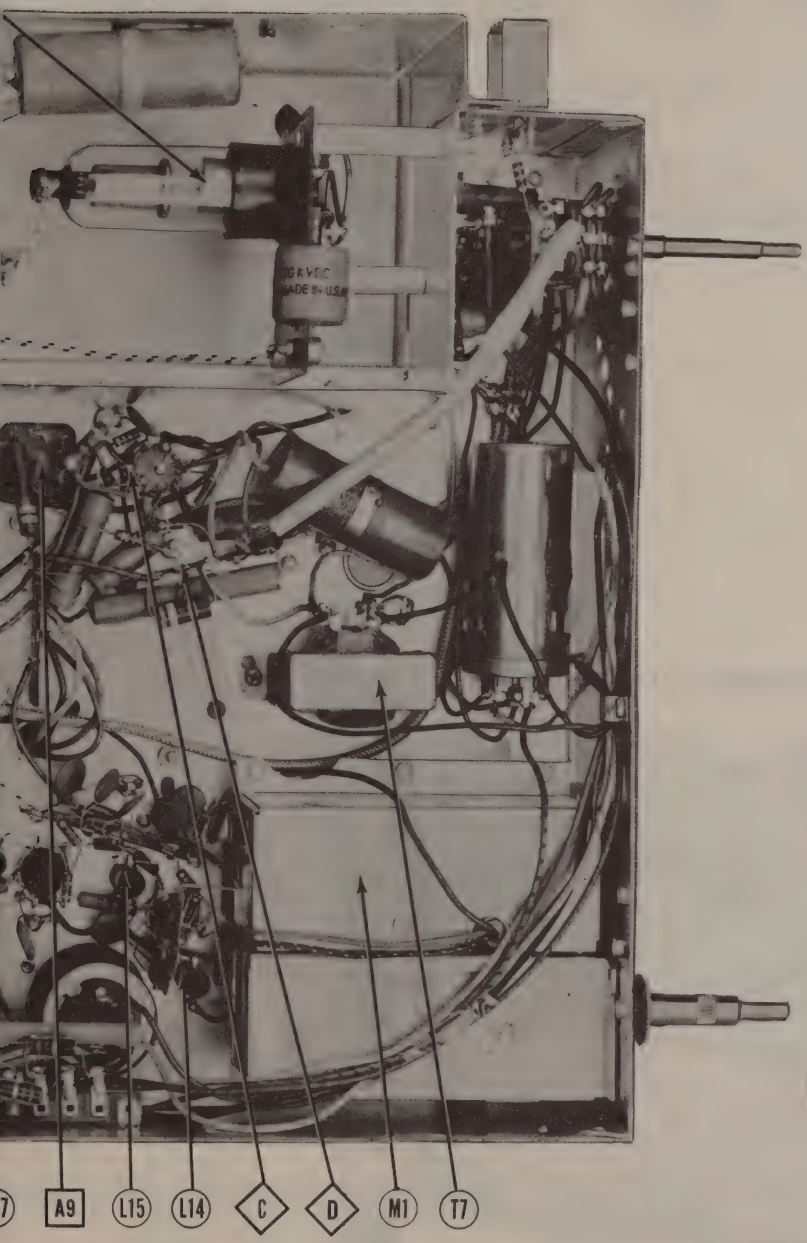


CTOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If the picture tube is to be removed while alignment is being made the high voltage lead should be securely taped and dressed away from the chassis.

VIDEO IF ALIGNMENT

Remove the local oscillator tube (V3) from its socket to prevent erroneous indications.
Connect a short piece of wire from junction of R20 and R22 to -4 volt.
It should be noted that the common lead of the VTVM is connected to -4 volts with respect to chassis. Avoid grounding the VTVM case.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	Not used	25.65MC (Unmod.)	Any	Use VTVM. DC Probe to Point (A) Common to Point (B).	A1, A2,	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum 3.5 volts reading.
2.	Direct	"	"	23.7MC	"	"	A3, A4	"
3.	Direct	"	24MC (10MC SWP)	26.4MC	"	Vert. Amp. to Point (A). Low side to chassis.	A5	Adjust A5 to place 26.4MC marker at 50% of response as shown in figure 1. If necessary retouch A1 thru A4 for response curve similar to figure 1.

SOUND IF ALIGNMENT

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (Grid) of 6AH6 (V10). Low side to chassis.	4.5MC (450KC Sweep)	4.5MC	Any	Vert. Amp. to Point (C). Low side to chassis.	A6, A7, A8	Disconnect stabilizer capacitor C4. Adjust for maximum amplitude and symmetry as per figure 2.
5.	.01MFD	"	"	"	"	Vert. Amp. to Point (D). Low side to chassis.	A9	Reconnect capacitor C4. Adjust A9 to place 4.5MC at center of crossover lines as per figure 3. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

NOTE. THE RF TUNER USED IN THIS SET IS ALIGNED AT THE FACTORY AND IS VERY STABLE AND SHOULD NOT REQUIRE ADJUSTMENT IN THE FIELD.

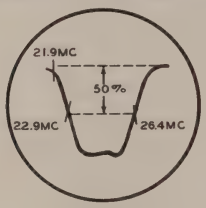


FIG. 1

FIG. 2

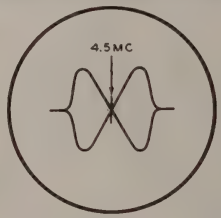
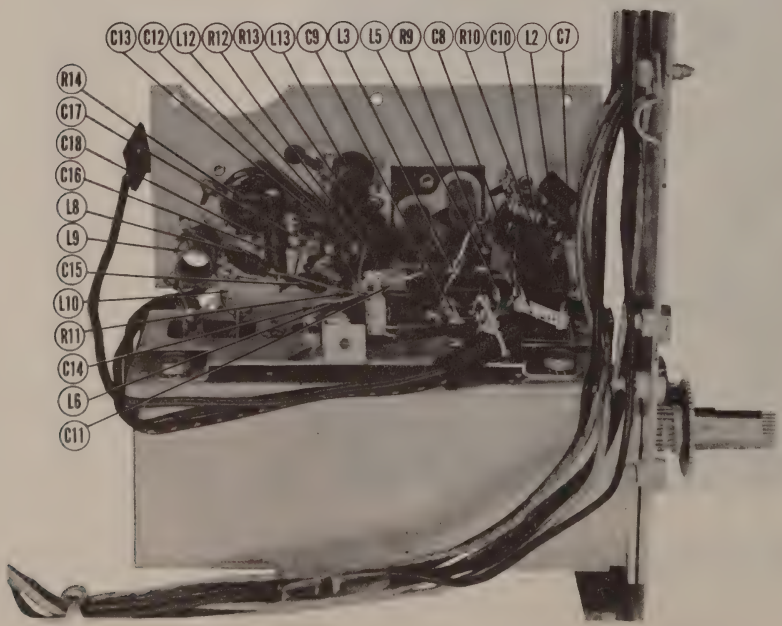
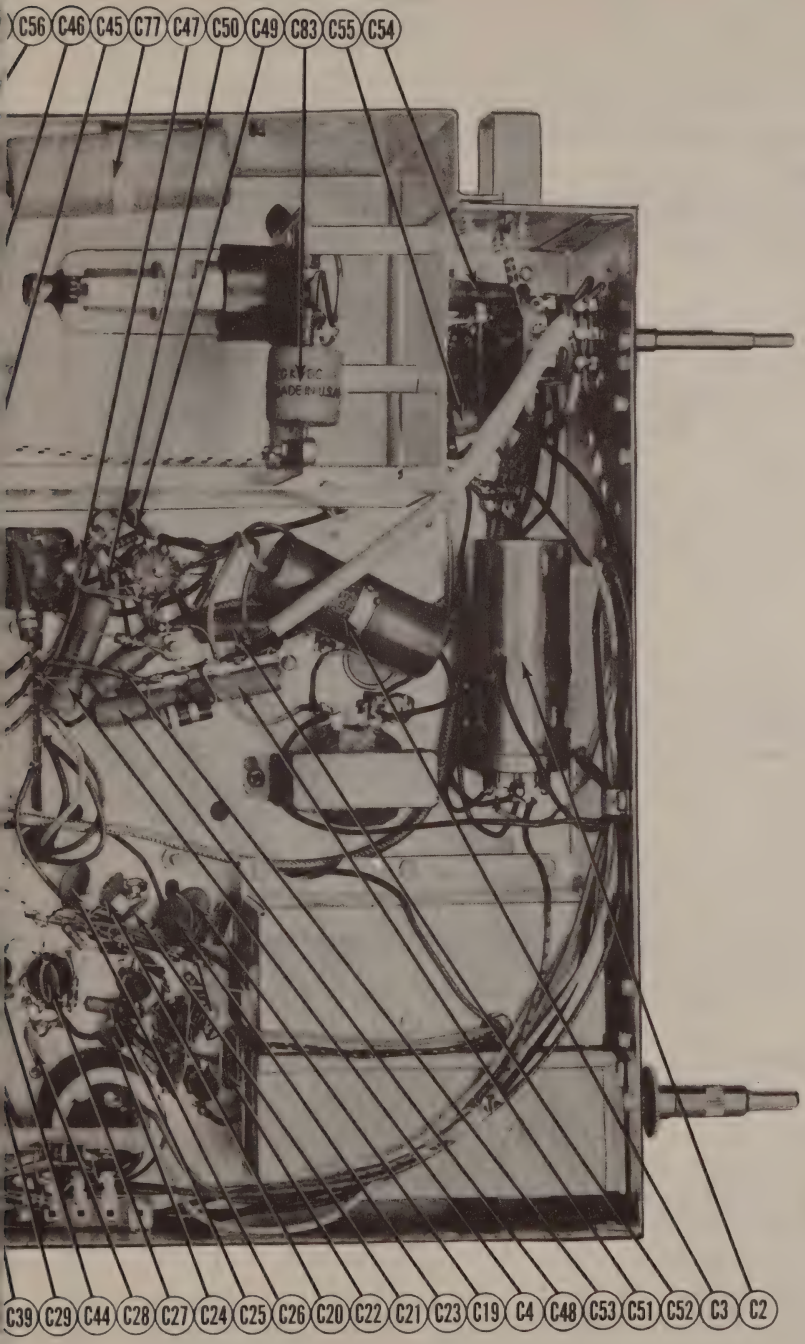


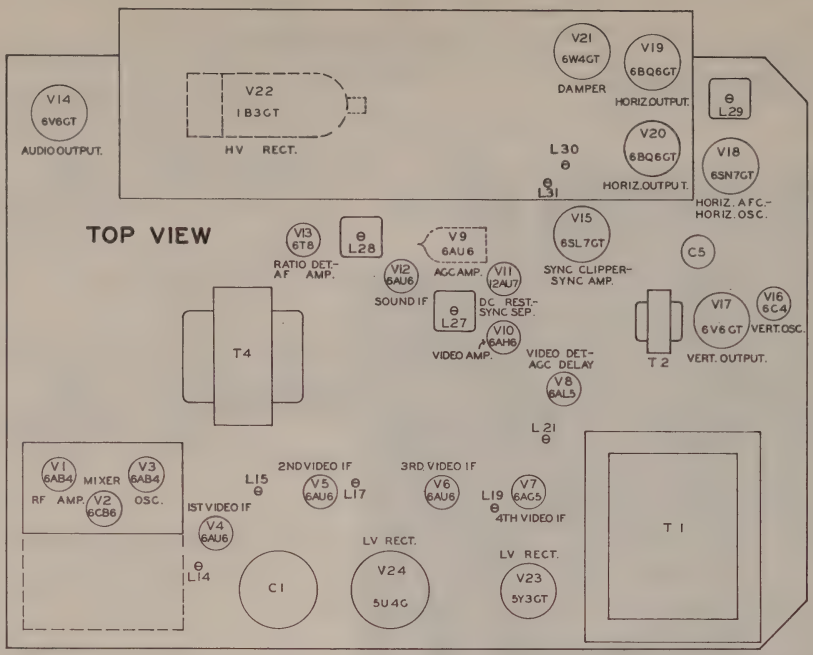
FIG. 3

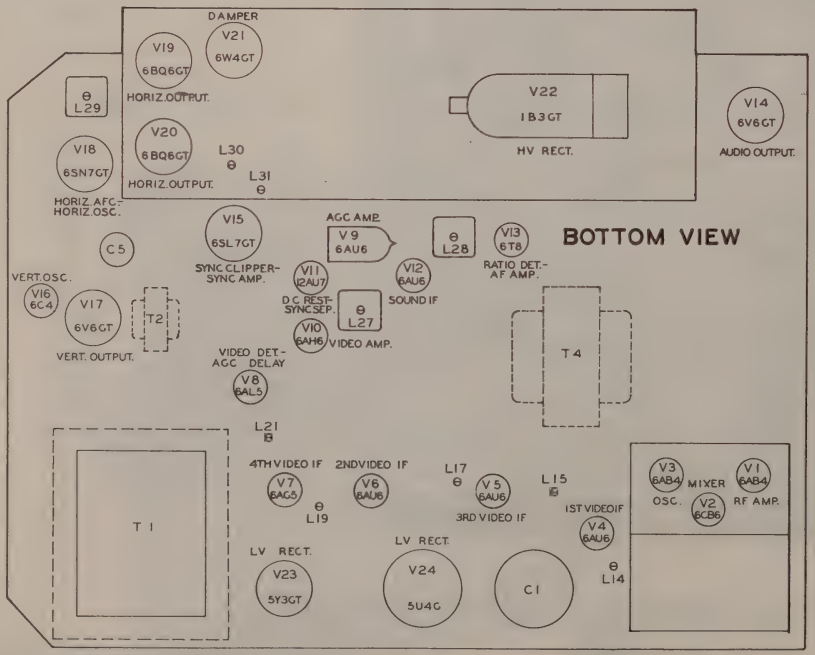


RF TUNER



APACITOR IDENTIFICATION





TUBE PLACEMENT CHART

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL FREQUENCY ADJUSTMENT

Connect a jumper across terminals 5 and 6 of the horizontal oscillator transformer L29. Tune in a station and, if possible, sync the picture and proceed as follows:

1. Turn horizontal hold control fully clockwise. Adjust the frequency adjustment (B1) so picture is just out of sync and the horizontal blanking appears as a vertical bar.
2. Turn the hold control approximately a quarter of a turn from the fully clockwise position and notice the picture width and linearity. If the width and linearity (B4) controls until the picture is correct. If B2, B3 and B4 required adjustment repeat step 1 above.

HORIZONTAL LOCKING RANGE ADJUSTMENT

Turn the horizontal hold control fully counter-clockwise. Remove signal momentarily by turning channel switch to another channel and back again. Slowly turn the hold control clockwise and note the number of diagonal bars that appear just before the picture "syncs".

If more than 9 bars are present just before synchronization, turn the horizontal locking range trimmer (B5) slightly clockwise. If less than 7 bars are present, turn B5 slightly counter-clockwise. Turn the hold control counter-clockwise and momentarily interrupt the signal and check the number of bars present at the pull-in point. Repeat this procedure until 7 to 9 bars are present.

HORIZONTAL OSCILLATOR WAVEFORM ADJUSTMENT

Remove the jumper across terminals 5 and 6 of L29.

Turn the horizontal hold control fully clockwise. Adjust B6 with non-metallic screwdriver until the horizontal blanking bar is present on the raster.

Connect the low capacity probe of an oscilloscope to terminal 5 of L29. Turn the horizontal hold control one quarter of a turn from the clockwise position until the picture "syncs". The pattern on the scope should be similar to figure 4. Adjust B6 until the broad and narrow peaks are of the same amplitude. (If necessary, while making this adjustment turn the hold control to keep the picture in synchronization.)

This adjustment must be carefully made to assure correct circuit operation. If the broad peak is lower in amplitude than the sharp peak, the oscillator drift becomes greater and the circuit has great susceptibility to noise pulses. However, if the broad peak is greater in amplitude than the sharp peak, the oscillator is overstabilized , the pull in-range inadequate, and there is the possibility of double triggering of the oscillator as the horizontal hold control approaches the extreme clockwise position.

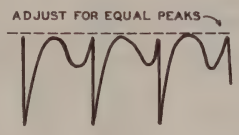


FIG. 4

HORIZONTAL OSCILLATOR ADJUSTMENTS CHECK

Turn the horizontal hold control fully counter-clockwise. Momentarily remove the signal and then slowly turn the hold control clockwise and note the number of bars present just before the picture synchronizes.

If more than 3 bars are present turn B5 slightly clockwise. If less than 3 bars are present, turn B5 slightly counter-clockwise. Momentarily remove the signal and recheck the bars present at the pull-in point. Repeat this procedure until 3 bars are present just before synchronization occurs.

Turn the horizontal hold fully clockwise. The picture should be just out of synchronization to the extent that the horizontal blanking bar appears as a single vertical or diagonal bar in the picture. Retouch B1 until this condition exists.

AUTOMATIC GAIN CONTROL ADJUSTMENTS

Tune in a TV station with a strong signal. Connect the vertical amplifier input of oscilloscope to Point A and adjust automatic gain control for 5 volts peak to peak detector output.

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove five wood screws holding rear cover in place. Remove rear cover.
3. Disconnect speaker leads.
4. Disconnect picture tube socket.
5. Remove built-in antenna terminal strip.
6. Remove two wood screws bracing chassis to rear of cabinet.
7. Remove two 3/8" and one 5/16" hex head bolts holding set in cabinet.

NOTE: Chassis must be removed before cathode ray tube removal is possible.

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AB4	6AB4	5CE	
V2	Mixer	6CB6	6CB6	7CM	
V3	Oscillator	6AB4	6AB4	5CE	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	4th Video IF	6AG5	6AG5	7BD	
V8	Video Det. -AGC Delay	6AL5	6AL5	6BT	
V9	AGC Amp.	6AU6	6AU6	7BK	
V10	Video Amp.	6AH6	6AH6	7BK	
V11	DC Rest. -Sync. Sep.	12AU7	12AU7	9A	
V12	Sound IF Amp.	6AU6	6AU6	7BK	
V13	Ratio Det. -AF Amp.	6T8	6T8	9E	
V14	Audio Output	6V6GT	6V6GT	7AC	
V15	Sync. Clipper-Sync. Amp.	8SL7GT	8SL7GT	8BD	
V16	Vert. Osc.	6C4	6C4	6BG	
V17	Vert. Amp.	6V6GT	6V6GT	7AT	
V18	Hor. Osc. -AFC	6SN7GT	6SN7GT	8BD	
V19	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V20	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V21	Damper	6W4GT	6W4GT	4CG	
V22	HV Rect.	1B3GT	1B3GT	3C	
V23	LV Rect.	5Y3GT	5Y3GT	5T	
V24	LV Rect.	5U4G	5U4G	5T	
V25	Picture Tube	16TP4	16TP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	475	B-147757	AFH88J		UP4450		TVL-2830	▲ Filter
B	40	475		PRS12/500		BR125		TVA-1132	■ Filter
C	500	10							▲ Filter
C2A	40	475	B-148429	AF8X8F20B		UP9CJ1214		TVL-2830	▲ Filter
B	40	250						TVA-1310	■ Decoupling
C	100	50							▲ Vert. Output Cath.
C3	30	300	B-146725	PRS450/40		BR4035		TVA-1611	Decoupling
C4	10	25	B-147758	PRS25/10		BR102A		TVA-1204	Stabilizing Cap.
C5A	10	475	B-148556	AFH222J		UP1150		TVL-3835	■ Vert. Osc. Dec.
B	10	475				BR435			▲ Vert. Output Dec.
C	4	350							V. Amp. Screen Byp.
C6	5	25	B-146944	PRS50/10		BR550		TVA-1203	Hor. Output Cath.
C7	5000		C-137727-48	GP5000M	D6-502		811-005		AGC Filter
C8	1000		C-137727-8	GP1000M	D6-102		GP2L-001		AGC Filter
C9	1000		C-137727-8	GP1000M	D6-102		GP2L-001		RF Bypass
C10	470		C-137727-104	GP470M	D6-471		GP2K-470		RF Fil. Bypass
C11	15		C-137727-107	CI15KNPO	D2-15		NPOK-15		RF Coupling
C12	470		C-137727-104	GP470M	D6-471		GP2K-470		Mixer Screen Byp.
C13	470		C-137727-104	GP470M	D6-471		GP2K-470		Mixer Fil. Byp.
C14	1000		C-137727-8	GP1000M	D6-102		GP2L-001		RF Bypass
C15	1		W-137398-2		D2-1				Osc. Coupling
C16	5		C-137727-103	CI5DN330			N030K-5		Osc. Grid Cap.
C17	6		C-137727-106	CN6DN330			N330K-6		Fixed Trimmer
C18	4		C-137727-105	CN4DN330			N330K-4		Fixed Trimmer
C19	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	AGC Filter
C20	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	RF Bypass
C21	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	RF Bypass
C22	100		C-137727-108	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	IF Coupling
C23	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	AGC Filter
C24	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	1st V. IF Dec.
C25	100		C-137727-108	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	IF Coupling
C26	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	AGC Filter
C27	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	2nd V. IF Dec.
C28	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	2nd V. IF Fil.
C29	100		C-137727-108	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	IF Coupling
C30	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	3rd V. IF Dec.
C31	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	3rd V. IF Cath.
C32	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	3rd V. IF Fil.
C33	100		C-137727-108	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	IF Coupling
C34	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	4th V. IF Dec.
C35	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	4th V. IF Cath.
C36	100		C-137727-108	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	IF Coupling
C37	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	Bias Filter
C38	.015	200	39001-14	P288-015		PTE6S15		TM-12	AGC Filter
C39	.25	200	39001-87	P488-25		GT2P25		TC-2	AGC Filter
C40	5		C-137727-103	GP5M	D2-4.7	5W5V5	GP1K-5	MS-55	V. Diode Filter
C41	.05	400	39001-17	P488-05		PTE4S5		TM-15	Video Coupling
C42	.1	400	39001-19	P488-1		PTE4P1		TM-1	Video Coupling
C43	.1	400	39001-19	P488-1		PTE4P1		TM-1	Pic. Tube Cath.
C44	100		C-137727-108	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	S. IF Coupling *
C45	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	S. IF Decoupling
C46	.02	400	39001-80	P488-02		PTE4S2		TM-12	S. IF Decoupling
C47	1000		C-137727-110	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	Diode Load Cap.
C48	.005	600	39001-11	P688-005	D6-502	PTE6D5	811-005	TM-25	De-emphasis
C49	5000		C-144675-2	BPD-5	D6-502	1D5D5	811-005	29C1	RF Bypass
C50	2.2		W-137398-4		D2-2.2				Balancing
C51	.01	400	39001-13	P488-01	D6-103	PTE4S1	811-01	TM-11	Audio Coupling
C52	.01	400	39001-13	P488-01	D6-103	PTE4S1	811-01	TM-11	Audio Coupling
C53	.00025	400	39001-73	P485-00025	D6-251	5W5T25	GP2K-250	TC-325	AF Amp. Plate
C54	.02	400	39001-80	P488-02		PTE4S2		TM-12	Audio Coupling
C55	.005	600	39001-11	P688-005	D6-502	PTE6D5	811-005	TM-25	Output Plate Byp.
C56	.01	400	39477-41	P488-01	D6-103	PTE4S1	811-01	TM-11	Sync. Coupling
C57	120	500	B-137498-17	1468-00015	D6-121	5W5T15	GP2K-120	1FM-315	Sync. Coupling
C58	390	500	B-137498-28	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Sync. Amp. Cath.
C59	.002	600	39001-74	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Integrator Net.
C60	.005	600	39001-11	P688-005	D6-502	PTE6D5	811-005	TM-25	Integrator Net.
C61	.005	600	39001-11	P688-005	D6-502	PTE6D5	811-005	TM-25	Integrator Net.
C62	.0047	600	39478-39	P688-0047	D6-472	PTE6D5	GP2M-0047	TM-25	Vert. Osc. Grid

CAPACITOR

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT: CROSLEY PART No.	REPLACEMENT: AEROVOX PART No.	REPLACEMENT: CENTRALAB PART No.
C63	.05	400	C-146434-6	P488-05	
C64	.1	400	39001-19	P488-1	
C65	.005	600	39001-11	P688-005	D6-502
C66	180	500	B-137498-24	1468-0002	D6-181
C67	.0022	600	39477-37	P688-0022	D6-222
C68	90	500	B-137498-54		D2-91
C69	5			GP5K	D2-4.7
C70	.25	200	39001-87	P488-25	
C71	.02	200	39001-80	P488-02	
C72	.05	400	39001-17	P488-05	
C73	200	500	B-137498-47	1468-0002	D6-201
C74	.01	400	C-148813-1	P488-01	D6-103
C75	1300	500	B-137498-53		
C76	390	500	B-137498-28	1469-0004	D6-391
C77	.5	600	B-148317-2	684-5	
C78	.1	600	B-148317-3	P688-1	
C79	.05	600	39001-17	P688-05	
C80	.15	400	C-146434-10	P488-15	
C81	.1	400	C-146434-3	P488-1	
C82	.5	200	B-148317-1	P288-5	
C83	500	20000	W-147375	HV20A	TV1-502
C84	5000		C-144675-2	BPD-5	D6-502
C85	220	1500	W-160111	1468-00025	D6-221

* Some models use 47MMF in this application. MFGR'S Part

CONT

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROST PART N
R1A	1 Meg.	½		(Concentrikit)	
B	2000Ω	½		B13-137 *	
C	Shaft End	½	C-148098	B11-112 *	RTV-55
D	Switch	½		E-187 *	
R2A	2.5 Meg.	½	B-148227	(76-1 *	
B	Shaft		Not Req.	Q11-239	AG-84-S
R3A	1.5 Meg.	½	B-148228	Not Req.	FKS-1/4"
B	Shaft		Not Req.	Q11-138	AM-83-S
R4A	50KΩ	½	B-146797	Not Req.	FKS-1/4"
B	Shaft		Not Req.	Q11-123	AG-44-S
R5A	40KΩ	½	B-146798	Not Req.	FKS-1/4"
B	Shaft		Not Req.	Q11-124	AG-43-S
R6A	1000Ω	½	B-148038	Not Req.	FKS-1/4"
B	Shaft		Not Req.	Q11-108	AM-49-S
R7A	5000Ω	½	B-144260	Not Req.	AM-19-S
B	Shaft		Not Req.	Q11-114	FKS-1/4"
R8	1500Ω	4	B-147079	Not Req.	RTV-71

* Additional parts to be used with "Concentrikit".

RESI

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: IRC PART No.
R9	3900Ω	½	39374-32	BTS-3900
R10	220KΩ	½	39374-53	
R11	1 Meg.	½	39374-61	
R12	150KΩ	½	39374-51	
R13	10KΩ	½	39374-37	
R14	12KΩ	½	39374-38	
R15	15KΩ 5%	½	39375-77	
R16	68Ω	½	39374-11	
R17	100Ω 20%	½	39374-13	
R18	100Ω 20%	½	39374-13	
R19	100Ω 20%	½	39374-13	
R20	10KΩ 20%	½	39374-37	
R21	560Ω	½	39374-25	BTS-560
R22	8200Ω 5%	½	39375-71	
R23	68Ω	½	39374-11	
R24	100Ω 20%	½	39374-13	
R25	6800Ω 5%	½	39375-69	
R26	68Ω	½	39374-11	
R27	100Ω 20%	½	39374-13	
R28	10KΩ 5%	½	39375-73	
R29	100Ω	½	39374-13	
R30	4700Ω 5%	½	39375-65	BTS-4700-5%
R31	100KΩ	½	39374-49	
R32	1000Ω	½	39374-25	BTS-1000
R33	82KΩ 5%	½	39375-95	
R34	8200Ω 5%	½	39375-71	
R35	330KΩ 5%	½	39375-109	
R36	560KΩ 5%	½	39375-115	
R37	47Ω	½	39374-9	
R38	82KΩ	1	39374-224	BTA-82K
R39	10KΩ 5%	2	39375-369	BT-2-10K-5%
R40	6800Ω	½	39374-35	BTS-6800
R41	3300Ω	½	39374-31	BTS-3300
R42	10KΩ	2	39375-221	BT-2-10K
R43	820KΩ	½	39374-60	BTS-820K
R44	120KΩ	½	39374-50	BTS-120K
R45	180KΩ	½	39374-52	BTS-180K
R46	47KΩ	½	39374-45	BTS-47K
R47	100KΩ	½	39374-49	BTS-100K
R48	1000Ω	½	39374-25	BTS-1000
R49	39KΩ	2	39374-220	BT-2-39K
R50	6800Ω	1	39374-123	BTA-6800
R51	47KΩ	2	39384-221	BT-2-47K
R52	2200Ω	½	39374-29	BTS-2200
R53	6800Ω	1	39374-123	BTA-6800
R54	47KΩ	½	39374-45	
R55	47KΩ	½	39374-45	
R56	27KΩ 5%	2	39374-130	
R57	18KΩ 5%	½	39375-79	BTS-18K-5%
R58	22KΩ	½	39374-42	BTS-22K
R59	10 Meg. 20%	½	39374-85	BTS-10 Meg.

TIONS (Continued)

ONT.)

ELL-IER No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
S5		TM-15	Vert. Discharge
P1		TM-1	Vert. Sweep Coupling
D5	811-005	TM-26	RF Bypass
2	GP2K-180	1FM-32	Hor. Sync. Coupling
D2	GP2M-0022 NPOM-91	TM-22	Hor. Sync. Coupling Voltage Divider
5	GP1K-5	MS-55	Hor. Feedback
25		TC-2	AFC Filter
S2		TM-12	AFC Filter
S5		TM-15	Hor. AFC Plate
2	GP2K-200	1FM-32	Hor. Osc. Grid
S1	811-01	TM-11	Fixed Trimmer Hor. Discharge
4	GP2K-390	1FM-34	Hor. Sweep Coupling
5		TC-5	Decoupling
3P1		TM-1	Decoupling
3S5		TM-15	Hor. Output Screen Damper Filter
1P1		TM-1	Damper Filter
5		TC-5	Hor. Sweep Coup. HV Filter
5	811-005	29C1	RF Bypass
25	GP2K-220	1FM-325	RF Bypass

37727-112.

ENTRALAB ART No.	INSTALLATION NOTES
	Volume control-front
	Contrast control and switch-rear
3B-638-S	Attach per instr. in "concentrikit".
	Attach per instr. in "concentrikit".
N-83	Height control
K-1	Attach to R2A per instructions
N-75	Vert. hold control
K-1	Attach to R3A per instructions
N-31	Horiz. hold control
K-1	Attach to R4A per instructions
N-31	Brightness control
K-1	Attach to R5A per instructions
N-5	AGC control
K-1	Attach to R6A per instructions
W-10	Vert. linearity control
K-1	Attach to R7A per instructions
P-994	Focus control-Wire Wound

S

IDENTIFICATION CODES

RESISTORS ARE ± 10% UNLESS OTHERWISE STATED

Amp. Plate Coil Shunt
Network
er Grid
er Screen
er Plate Coil Shunt
Grid
Video IF Amp. Grid
Video IF Amp. Cathode
upling
upling
upling
Network
Network-See Note 1
Video IF Amp. Grid
Video IF Amp. Cathode
upling
Video IF Amp. Grid
Video IF Amp. Cathode
upling
Video IF Amp. Grid
Video IF Amp. Cathode
o Det. Diode Load
Network
Network
Network
Network
Network
age Divider
age Divider
o Amp. Screen
o Amp. Plate
o Amp. Plate Coil Shunt
ation
age Divider
age Divider
age Divider
Test. Load
Test. Load
ure Tube Grid
ting Coil Shunt
age Divider
age Divider
age Divider
age Divider
nerating Anode Load
d IF Amp. Grid
age Divider
d IF Amp. Decoupling
o Det. Diode Load
mphasis
Amp. Grid

RESISTORS (CONT.)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	CROSLEY PART No.	IRC PART No.	
R60	100KΩ	½	39374-49	BTS-100K	AF Amp. Plate
R61	2.2 Meg. 5%	½	39375-129	BTS-2.2 Meg. 5%	Voltage Divider
R62	100KΩ 5%	½	39375-97	BTS-100K-5%	Audio Output Grid
R63	390Ω	2	39374-196	BW-2-390	Audio Output Decoupling
R64	100Ω 20%	½	39374-13	BW-½-100	Decoupling
R65	1 Meg.	½	39374-61	BTS-1 Meg.	Sync. Clipper Grid
R66	18KΩ	½	39374-40	BTS-18K	Sync. Clipper Plate
R67	3.3 Meg. 20%	½	39374-73	BTS-3.3 Meg.	Sync. Amp. Grid
R68	6800Ω	½	39374-35	BTS-6800	Sync. Amp. Cathode
R69	22KΩ	½	39374-41	BTS-22K	Integrator
R70	8200Ω	½	39374-36	BTS-8200	Integrator
R7	8200Ω	½	39374-36	BTS-8200	Integrator
R72	1.2 Meg.	½	39374-63	BTS-1.2 Meg.	Vert. Osc. Grid
R73	10KΩ 20%	½	39374-37	BTS-10K	Vert. Osc. Transformer Shunt
R74	220KΩ	½	39374-53	BTS-220K	Vert. Osc. Plate
R75	8200Ω	½	39374-36	BTS-8200	Vert. Peaking
R76	2.2 Meg.	½	39374-69	BTS-2.2 Meg.	Vert. Amp. Grid
R77	1000Ω	½	39374-25	BTS-1000	Vert. Amp. Cathode-See Note 2
R78	2200Ω	1		BTA-2200	Vert. Amp. Decoupling
R79	820KΩ	½	39374-60	BTS-820K	Horiz. AFC Grid
R80	8200Ω	½	39374-36	BTS-8200	Horiz. AFC Filter
R81	150KΩ	½	39374-51	BTS-150K	Horiz. AFC Cathode
R82	150KΩ	½	39374-51	BTS-150K	Horiz. AFC Cathode
R83	68KΩ	½	39374-47	BTS-68K	Voltage Divider
R84	150KΩ	1	39374-139	BTA-150K	Voltage Divider
R85	2.7 Meg.	½	39374-71	BTS-2.7 Meg.	Voltage Divider
R86	100KΩ 5%	½	39375-97	BTS-100K-5%	Horiz. Osc. Grid
R87	10KΩ	½	39374-37	BTS-10K	Horiz. Transformer Shunt
R88	22KΩ	½	39374-41	BTS-22K	Horiz. Transformer Shunt
R89	470KΩ	½	39374-57	BTS-470K	Horiz. AFC Filter
R90	39KΩ	½	39374-44	BTS-39K	Horiz. AFC Feedback
R91	820KΩ	½	39374-60	BTS-820K	Horiz. AFC Feedback
R92	100KΩ	1	39374-137	BTA-100K	Horiz. Osc. Plate
R93	100Ω	½	39374-13		Parasitic Suppressor
R94	470KΩ	½	39374-57	BTS-470K	Horiz. Output Grid
R95	47Ω	1	39374-97	BW-1-47	Horiz. Output Cathode
R96	100Ω	½	39374-13		Parasitic Suppressor
R97	100Ω	½	39374-13		Parasitic Suppressor
R98	68KΩ	2	39374-223	BT-2-68K	Horiz. Output Screen
R99	68KΩ	2	39374-223	BT-2-68K	Horiz. Output Screen
R100	100Ω	½	39374-13		Parasitic Suppressor
R101	18KΩ	½	39374-40	BTS-18K	Filter
R102	1000Ω	½	39374-25	BTS-1000	Decoupling
R103	82KΩ	½	39374-48	BTS-82K	Decoupling
R104	270KΩ	1	39374-142	BTA-270K	Voltage Divider
R105	15KΩ	2	39374-215	BT-2-15K	Current Limiting
R106	8.2Ω 5%	½	39303-19		HV Rect. Filament
R107	1 Meg.	½	39374-149		HV Filter
R108	400Ω	5	W-148554	AB-400	Series Focus Control-Wire Wound
R109	4700Ω	2	39374-209	BT-2-4700	Focus Coil Shunt
R110	4700Ω	2	39374-209	BT-2-4700	Focus Coil Shunt
R111	22Ω	1	39374-93	BW-1-22	Bias Network

Note 1. Some models use a 1000Ω resistor in this application.
Note 2. Some models use a 560Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	CROSLEY PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ④ 1.8A	680VCT .200ADC	5VAC ③ 6A	6.3VAC ② 3A SEC. 4 6.3VAC ② 7.8A SEC. 5 6.3VAC ② 1.2A	C-148562			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA CROSLEY PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	176Ω	720Ω	B-146842-1	A-8111	H-3000	TBO-1 ①	Vert. Block Osc. Trans.
T3	30Ω	150Ω SEC. 2 7.2Ω Tap ④ 4.4Ω SEC. 3 0Ω	AD-148258		HVO-6		Hor. Output Trans.
T4	880Ω Tap ④ 140Ω		B-148296	A-8123	A-3037		Vert. Output Trans.
T5A	140Ω		AC-148887-3	DY-7 ③	MD-70F		Hor. Deflection Coil
B	63Ω						Vert. Deflection Coil
T6	520Ω		AB-147430		MF-2		Focus Coil

① Drill one new mounting hole.
③ Add resistors externally.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA CROSLEY PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	5400Ω	4.3Ω	360Ω	.6Ω	B-142890	A-3849	A-3019	RO-9 ①	① Drill one new mounting hole.

CROSLEY
MODEL 10-421MU

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

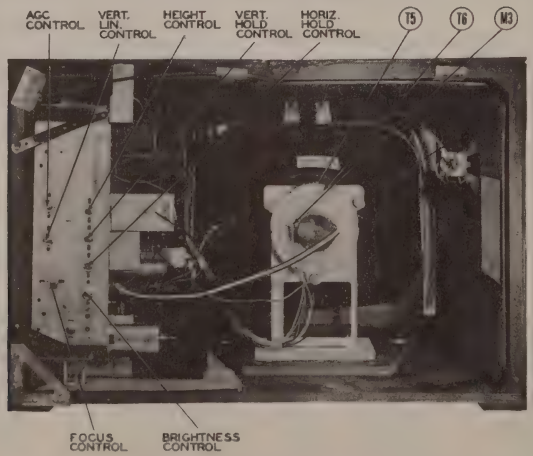
ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	CROSLEY PART No.	JENSEN PART No.	QUAM PART No.	
SP1	52Ω	4.5Ω	AD-148127		52E52S	
	CONE DIA.	V. C. DIA.				
SP2	5"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	CROSLEY PART No.	MEISSNER PART No.	
L1	Ant. Shunt	0Ω		AW-146735		
L2	Fil. Choke	0Ω		AW-146858		
L3	RF End Inductor	0Ω		AW-146985		
L4	RF Coil	0Ω		D-146656		Part of tuner combined with L7, L11
L5	RF Coupling	0Ω		AW-146988		
L6	Mixer Grid End Inductor	0Ω		AW-146987		
L7	Mixer Grid	0Ω		D-146656		Part of tuner combined with L7, L11
L8	RF Choke	0Ω		AW-147015		White dot
L9	Osc. Shunt	0Ω		AW-146753		Blue dot
L10	Osc. End Inductor	0Ω		AW-146986		
L11	Osc. Coil	0Ω		D-146656		Part of tuner combined with L4, L7
L12	RF Choke	0Ω		AW-146735		Blue dot
L13	1st Video IF	1Ω		AW-146755		Red dot
L14	1st Video IF Coupling	.1Ω		AW-146763		Green dot
L15	2nd Video IF	.1Ω		AW-146582		Yellow dot
L16	Fil. Choke	0Ω		AW-146855		
L17	3rd Video IF	.1Ω		AW-146583		Red dot
L18	RF Choke	4.8Ω		AW-146570		White dot
L19	4th Video IF	.1Ω		AW-146582		Yellow dot
L20	RF Choke	4.8Ω		AW-146570		White dot
L21	5th Video IF	.1Ω		AW-147022		Orange dot
L22	Peaking	20Ω		AW-146889		Blue dot
L23	Peaking	11.5Ω		AW-147993		Wound on 3.9KΩ resistor
L24	Peaking	11Ω		AW-147043		Wound on 22KΩ resistor
L25	Peaking	20Ω		AW-146889		
L26	Peaking	4.8Ω		AW-146570		White dot
L27	Sound IF	2.8Ω	2.2Ω	AC-146782		
L28	Ratio Det. Trans.	4.5Ω	.2Ω	C-146874		
L29	Horiz. Osc. Trans.	135Ω	38Ω	AC-146698		
L30	Horiz. Lin.	8.9Ω		AW-148452		
L31	Horiz. Size	3.8Ω	9Ω	AW-148381		
L32	RF Choke	120Ω		AW-148440		

MISCELLANEOUS

ITEM No.	PART NAME	CROSLEY PART No.	NOTES
M1	RF Tuner	AW-148164	
M2	Fuse	W-145780	
M3	Ion Trap	B-148484	
	Trimmer	B-132386-17	Horiz. drive, horiz. freq. 10-160MMF each section
	Antenna Assembly	AC-148531	
	Safety Glass	R-148155	
	Cabinet	R-148200	
	Dial	C-148482	Tuning
	Dial	C-148481	Volume-Contrast
	Knob	AW-147889	Tuning
	Knob	AW-147888	Volume
	Knob	AW-147887	Off-On-Contrast



CABINET–REAR VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AB4	150VDC	0V.	0V.	6.3VAC	6.3VAC	-.6VDC	0V.		
V 2	6CB6	-2.2VDC	0V.	0V.	6.3VAC	150VDC	65VDC	0V.		
V 3	6AB4	150VDC	0V.	0V.	6.3VAC	0V.	§-6.8VDC	0V.		
V 4	6AU6	-1.8VDC	0V.	6.3VAC	0V.	135VDC	135VDC	.7VDC		
V 5	6AU6	-.2VDC	0V.	6.3VAC	0V.	135VDC	135VDC	.7VDC		
V 6	6AU6	0V.	0V.	6.3VAC	0V.	135VDC	135VDC	.7VDC		
V 7	6AG5	0V.	1.1VDC	6.3VAC	0V.	130VDC	130VDC	1.1VDC		
V 8	6AL5	0V.	-4.4VDC	6.3VAC	0V.	§-3.2VDC	0V.	-.2VDC		
V 9	6AU6	-2VDC	0V.	6.3VAC	0V.	-6VDC	150VDC	0V. .8VDC		
V 10	6AH6	§-3.2VDC	0V.	6.3VAC	0V.	235VDC	300VDC	5.8VDC		
V 11	12AU7	6.8VDC	0V.	1.5VDC	6.3VAC	6.3VAC	0V.	0V.	0V.	0V.
# V 12	6AU6	-.4VDC	0V.	0V.	6.3VAC	55VDC	55VDC	0V.		
# V 13	6T8	-.6VDC	-2.6VDC	-.6VDC	0V.	6.3VAC	0V.	0V.	-.4VDC	95VDC
# V 14	6V6GT	0V.	6.3VAC	160VDC	170VDC	-4.8VDC	95VDC	0V.	0V.	
# V 15	6SL7GT	-. 6VDC	155VDC	0V.	-.3VDC	190VDC	1VDC	6.3VAC	0V.	
V 16	6C4	300VDC 100VDC	0V.	0V.	6.3VAC	300VDC 100VDC	-4VDC -3.6VDC	0V.		
V 17	6V6GT	0V.	6.3VAC	320VDC	320VDC	-.3VDC	0V.	0V.	20VDC 36VDC	
V 18	6SN7GT	-36VDC	200VDC	0V.	-2.6VDC	175VDC 100VDC	-20VDC	6.3VAC	0V.	
V 19	6BQ6GT	0V.	0V.	-9VDC	120VDC	-9VDC	120VDC	6.3VAC	5.5VDC	TOP CAP *
V 20	6BQ6GT	0V.	0V.	0V.	120VDC	-9VDC	0V.	6.3VAC	5.5VDC	TOP CAP *
V 21	6W4GT	280VDC	340VDC	520VDC	340VDC	340VDC	0V.	¶	¶	
V 22	1B3GT	* DO NOT MEASURE.								
V 23	5Y3GT	0V.	390VDC	0V.	340VAC	0V.	340VAC	6.3VAC	390VDC	
V 24	5U4G	0V.	390VDC	0V.	340VAC	0V.	340VAC	0V.	390VDC	
V 25	16TP4	0V.	.6VDC	PIN 10 340VDC	PIN 11 20VDC 75VDC	PIN 12 6.3VAC				

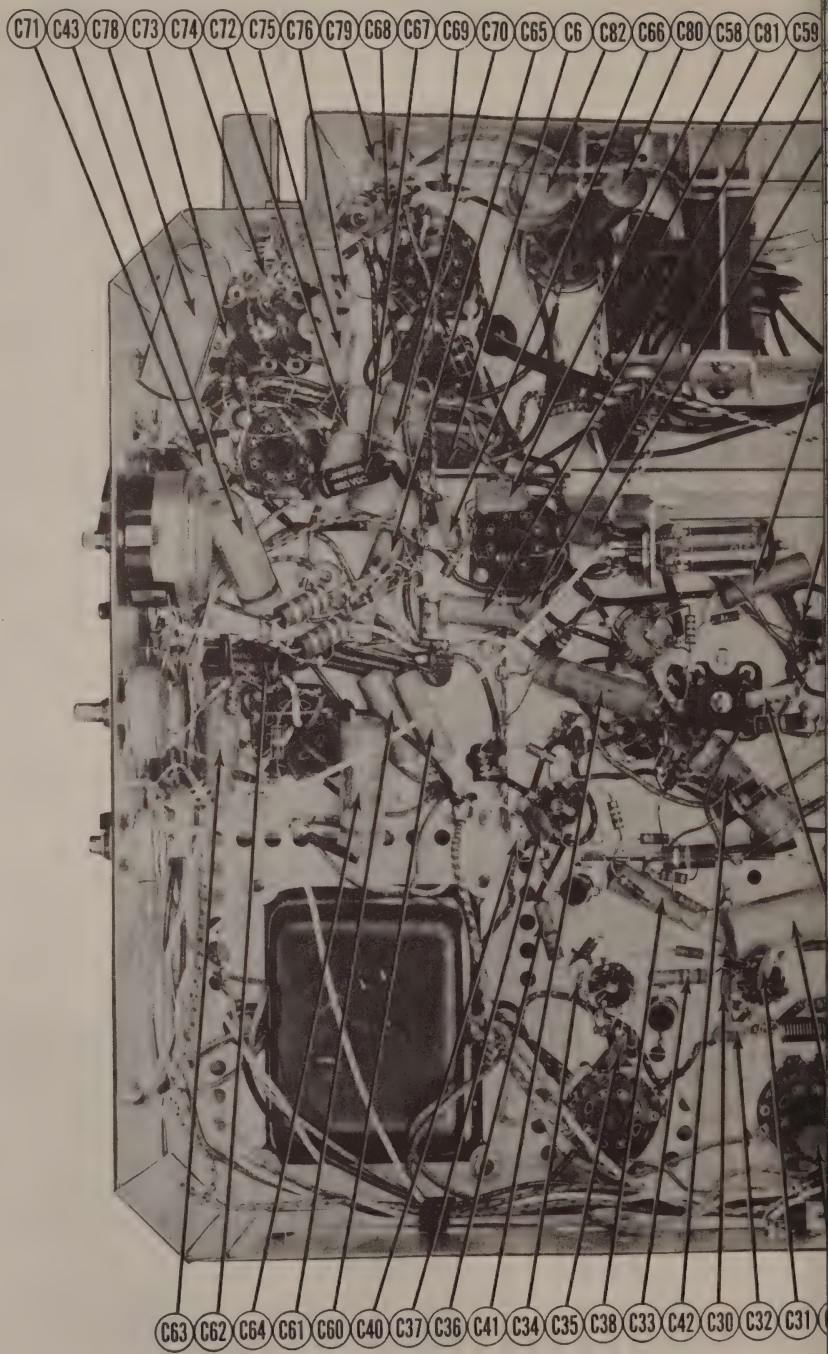
FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
* DO NOT MEASURE.
§ TAKEN WITH VACUUM TUBE VOLTMETER.
# MEASURED FROM JUNCTION OF C2A and C3.
¶ 6.3VAC MEASURED ACROSS FILAMENTS

RESISTANCE READINGS

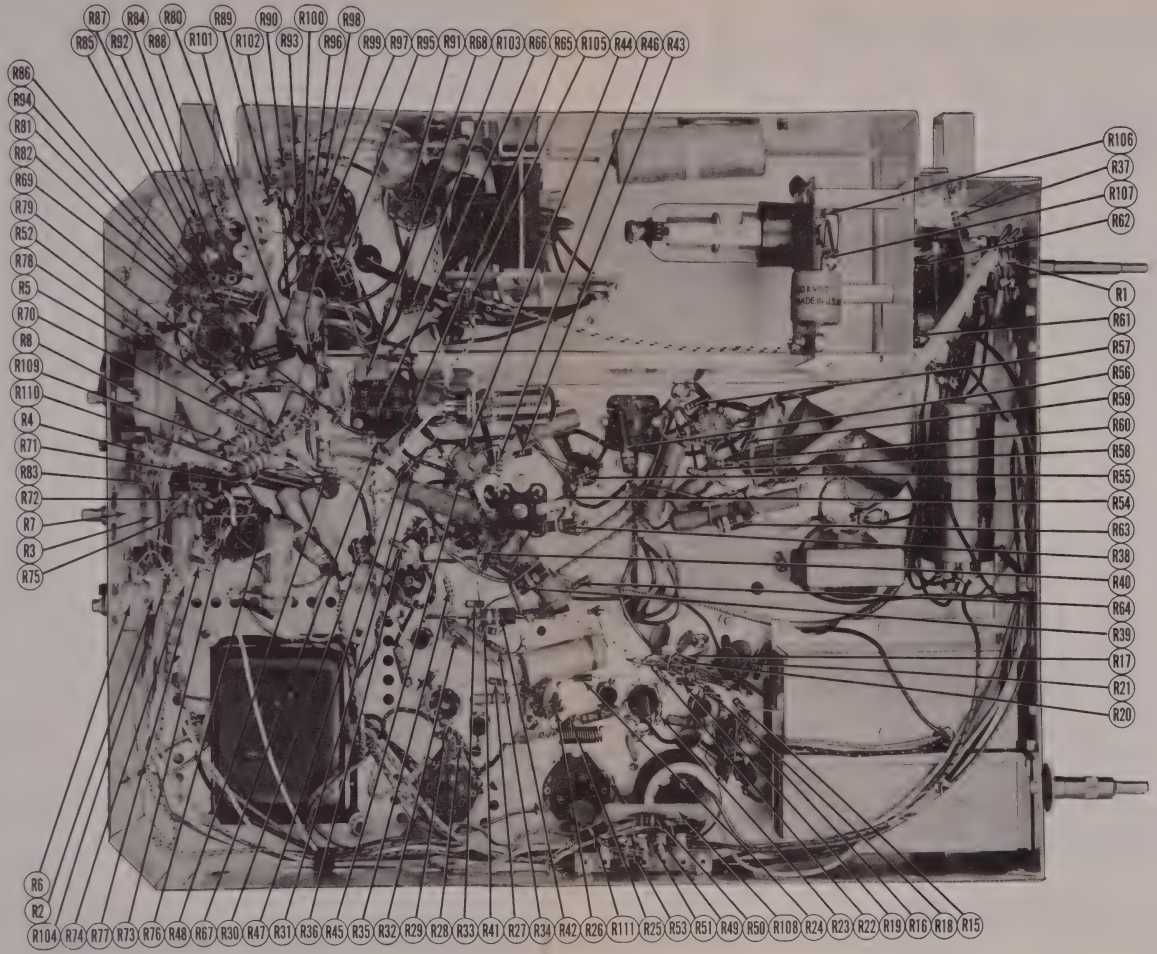
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AB4	#200Ω	Inf.	0Ω	.1Ω	.1Ω	470KΩ	0Ω		
V 2	6CB6	1 Meg.	0Ω	0Ω	.1Ω	#200Ω	#150KΩ	0Ω		
V 3	6AB4	#200Ω	Inf.	0Ω	.1Ω	Inf.	12KΩ	0Ω		
V 4	6AU6	33KΩ	0Ω	.1Ω	0Ω	#200Ω	#200Ω	68Ω		
V 5	6AU6	16.4KΩ	0Ω	.1Ω	0Ω	#300Ω	#300Ω	68Ω		
V 6	6AU6	6.8KΩ	0Ω	.1Ω	0Ω	#400Ω	#400Ω	68Ω		
V 7	6AG5	.1Ω	100Ω	.1Ω	0Ω	#500Ω	#500Ω	100Ω		
V 8	6AL5	0Ω	22Ω	.1Ω	0Ω	4.7KΩ	0Ω	250KΩ		
V 9	6AU6	105KΩ	0Ω	.1Ω	0Ω	85KΩ	#0Ω	1000Ω 10Ω		
V 10	6AH6	4.7KΩ	0Ω	.1Ω	0Ω	†9KΩ	†82KΩ	2000Ω		
V 11	12AU7	47KΩ	0Ω	300KΩ	.1Ω	.1Ω	Inf.	Inf.	Inf.	0Ω
V 12	6AU6	#47KΩ	#0Ω	#0Ω	#.1Ω	†20KΩ	†20KΩ	#0Ω		
V 13	6T8	Inf.	#18KΩ	Inf.	#0Ω	#.1Ω	Inf.	#0Ω	#10 Meg.	†100KΩ
V 14	6V6GT	Inf.	#.1Ω	†1.1KΩ	†790Ω	#100KΩ	#100KΩ	#0Ω	#0Ω	
V 15	6SL7GT	#1 Meg.	†18KΩ	#0Ω	#3.3 Meg.	†400Ω	#6.8KΩ	#.1Ω	#0Ω	
V 16	6C4	♦300KΩ ♦3 Meg.	Inf.	0Ω	.1Ω	♦300KΩ ♦3 Meg.	1.2 Meg. 2.7 Meg.	0Ω		
V 17	6V6GT	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	2.2 Meg.	Inf.	0Ω	6000Ω 1000Ω	
V 18	6SN7GT	250KΩ	♦120KΩ	0Ω	900KΩ	♦135KΩ ♦150KΩ	300KΩ	.1Ω	0Ω	
V 19	6BQ6GT	Inf.	0Ω	470KΩ	†34KΩ	470KΩ	†34KΩ	.1Ω	47Ω	TOP CAP ♦38Ω
V 20	6BQ6GT	Inf.	0Ω	Inf.	†34KΩ	470KΩ	Inf.	.1Ω	47Ω	TOP CAP ♦38Ω
V 21	6W4GT	†820KΩ	†400Ω	170KΩ	†400Ω	†400Ω	Inf.	Inf.	Inf.	
V 22	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ♦15KΩ
V 23	5Y3GT	Inf.	35KΩ	Inf.	46Ω	Inf.	48Ω	.1Ω	35KΩ	
V 24	5U4G	Inf.	35KΩ	Inf.	46Ω	Inf.	48Ω	Inf.	35KΩ	
V 25	16TP4	0Ω	220KΩ	PIN 10 †400Ω	PIN 11 8000Ω 2200Ω	PIN 12 .1Ω				

FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
MEASURED FROM JUNCTION OF C2A and C3.
† MEASURED FROM PIN 2 OF V24.
♦ MEASURED FROM PIN 3 OF V21.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CHASSIS BOTTOM VIEW-



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

DEWALD MODEL D-508
(BATTERY-LINE OPERATED)

DEWALD MODEL D-508

TRADE NAME	Dewald, Model D-508
MANUFACTURER	Dewald Radio Mfg., Corp., 35-15 37th Ave., Long Island City, New York
TYPE SET	Three Power Operated Portable Three Band Superheterodyne Receiver with Loop Antenna
TUBES	Types 1R5 Converter, 1T4 IF Amp., 1U5 DET-AVC-AF, 3V4 Power Output
POWER SUPPLY	105-125 Volts AC-DC or 9 Volts "A" Supply and 90 Volts "B" Supply
RATING	.15 Amp. at 117 Volts AC or 50MA at 9 Volts DC and 10MA at 90 Volts DC
TUNING RANGE—BROADCAST	540-1700KC SHORT WAVE #1 5.3-16.7MC #2 1.9- 5.5MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer to reference mark at low frequency end of dial backplate.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to pin 6 (Grid) of 1R5 (V1). Low side thru .1MFD to chassis.	455KC (400 ∿ Mod.)	AM (fully CCW)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	200MMF	High side to external antenna lead. Low side thru .1MFD to chassis.	1700KC	"	"	"	A5	Adjust for maximum output.
3.	200MMF	"	600KC	"	Tune for max. output	"	A6	Adjust for maximum output while rocking tuning gang. Repeat steps 2 and 3 until no further improvement can be made.
4.	200MMF	"	16.7MC	SW #1 (2nd position CW)	Tuning gang fully open	"	A7	Adjust for maximum output.
5.	200MMF	"	15.7MC	"	Tune for max. output.	"	A8	"
6.	200MMF	"	5.5MC	SW #2 (fully CW)	Tuning gang fully open	"	A9	"
7.	200MMF	"	5MC	"	Tune for max. output.	"	A10	"

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 1, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

DEWALD MODEL D-508

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1T4	1T4	6AR	
V3	DET-AVC-AF	1U5	1U5	6BW	
V4	Power Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DEWALD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	60	150	2005-4	AF126D30A				TVL-3427 *	■ Filter
B	30	150						TVA-1206	▲ Filter
C	150	25							Filament Bypass
C2	.01	600		P688-01	D6-103	PTE6S1	811-01	TM-11	Ant. Isolation
C3	47			GP47M	D6-470	5W5Q5	GP1K-47	1FM-45	Osc. Grid Cap.
C4	2.5				TCZ-2.2				Osc. Coupling
C5	1500			GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	Fixed Padder
C6	.05	200		P288-05	DF-503	PTE4S5		TM-15-2	AVC Filter
C7	.05	400		P488-05	DF-503	PTE4S5		TM-15-4	Decoupling
C8	.1	200		P288-1	DF-104	PTE4P1		TM-1-2	RF Bypass
C9	.25	150		P488-25		GT2P25		TM-2-2	Filament Bypass
C10	220			GP220M	D6-221	5W5T25	GP2K-220	1FM-325	Diode RF Filter
C11	.001	600		P688-001	D6-102	PTE6D1	GP2L-001	TM-21	Audio Coupling
C12	.02	200		P488-02	DF-203	PTE4S2		TM-12-2	AF Amp. Screen
C13	220			GP220M	D6-221	5W5T25	GP2K-220	1FM-325	AF Amp. Plate
C14	.01	400		P488-01	D6-103	PTE4S1	811-01	TM-11-4	Audio Coupling
C15	.02	200		P488-02	DF-203	PTE4S2		TM-12-2	Output Plate Bypass
C16	.05	600		P688-05	DF- 503	PTE6S5		TM-15	Line Filter

* Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DEWALD PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	3006C-3	Q13-137	AM-63-Z	BSK-70-S.	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-2	SW-A2	Not Req.	Attach to R1A per instructions

RESISTORS

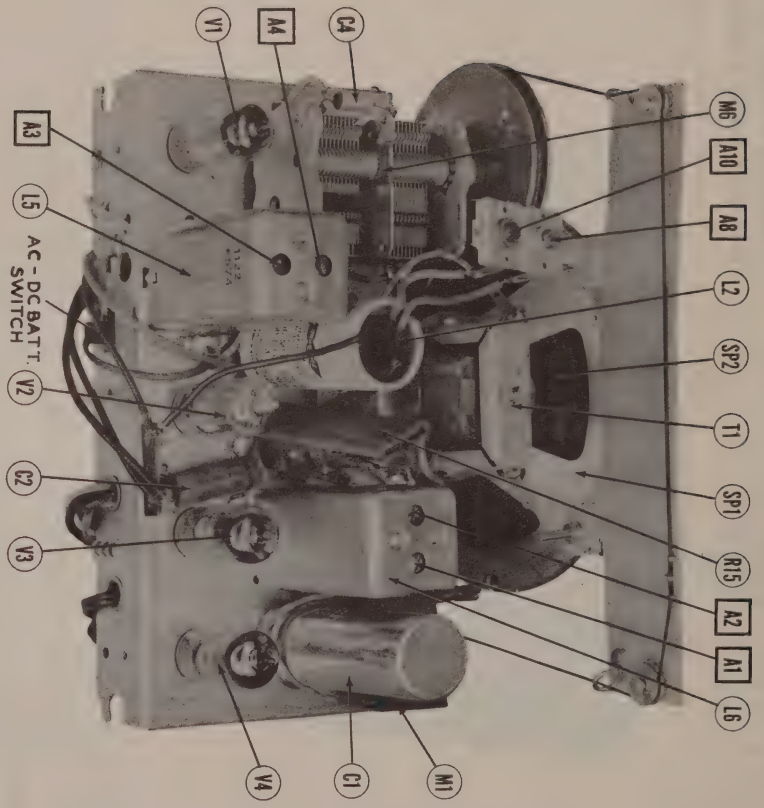
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DEWALD PART No.	IRC PART No.	IDENTIFICATION CODES
R2	100KΩ	½		BTS-100K	Osc. Grid
R3	10 Meg.	½		BTS-10 Meg.	AVC Network
R4	3.3 Meg.	½		BTS-3.3 Meg.	AVC Network
R5	10KΩ	½		BTS-10K	IF Amp. Screen
R6	10 Meg.	½		BTS-10 Meg.	AF Amp. Grid
R7	3.3 Meg.	½		BTS-3.3 Meg.	AF Amp. Screen
R8	1 Meg.	½		BTS-1 Meg.	AF Amp. Plate
R9	1 Meg.	½		BTS-1 Meg.	Output Grid
R10	220Ω	½		BW-½-220	Filament String
R11	470Ω	½		BTS-470	Filament Shunt
R12	35Ω	2	3005-2		Filament Dropping-Wire Wound
R13	2200Ω	1		BTA-2200	Filament String
R14	1500Ω	½		BTS-1500	Filament String- See Note 1
R15A	1900Ω	10	3007-2		Filament Dropping-Wire Wound
B	75Ω				Surge Limiter-Wire Wound
R16	2200Ω	1		BTA-2200	Filter
R17	47Ω	½			Parasitic Suppressor
R18	220Ω	½		BW-½-220	Filament Shunt

Note 1. Some models use a 2200Ω resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: DEWALD PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	7700Ω	4.5Ω	700Ω	.5Ω	Part of SP1	A-3329 ①	A-2927 ①	RO-13 ①	① Bend mounting tabs down and remount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: DEWALD PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-105 ②		
SP1	PM	4.5Ω	7001D-4	MOD. P5-X	5A07 ②	② Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	4 7/8"	9/16"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: MEISSNER PART No.	
L1	Loop Ant.	.1Ω	2Ω	1021-1		
L2	Ant. Coil	.2Ω	.1Ω	1125		Short wave band 1
		.4Ω	.4Ω			Short wave band 2
L3	Osc. Coil	1Ω	5.2Ω	1020-2		Standard broadcast
L4	Osc. Coil	.3Ω	.1Ω	1124		Short wave band 1
		.6Ω	.3Ω			Short wave band 2
L5	1st IF	17Ω	17Ω	1122	16-6658	
L6	2nd IF	14Ω	14Ω	1123	16-6660	

SELENIUM RECTIFIER

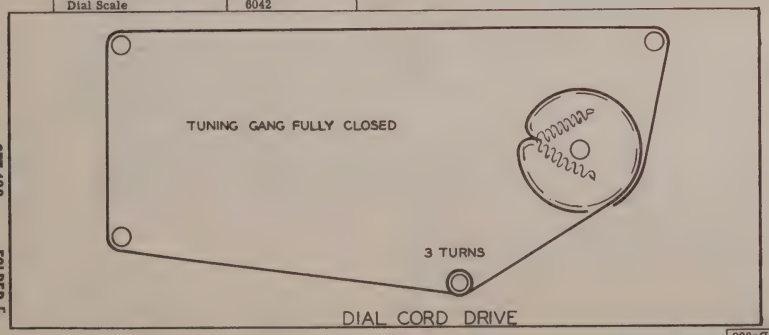
ITEM No.	RATING: CURRENT	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: SELETRON PART No.	NOTES
M1	.073ADC	8018B	NB-5	5M4	

BATTERIES

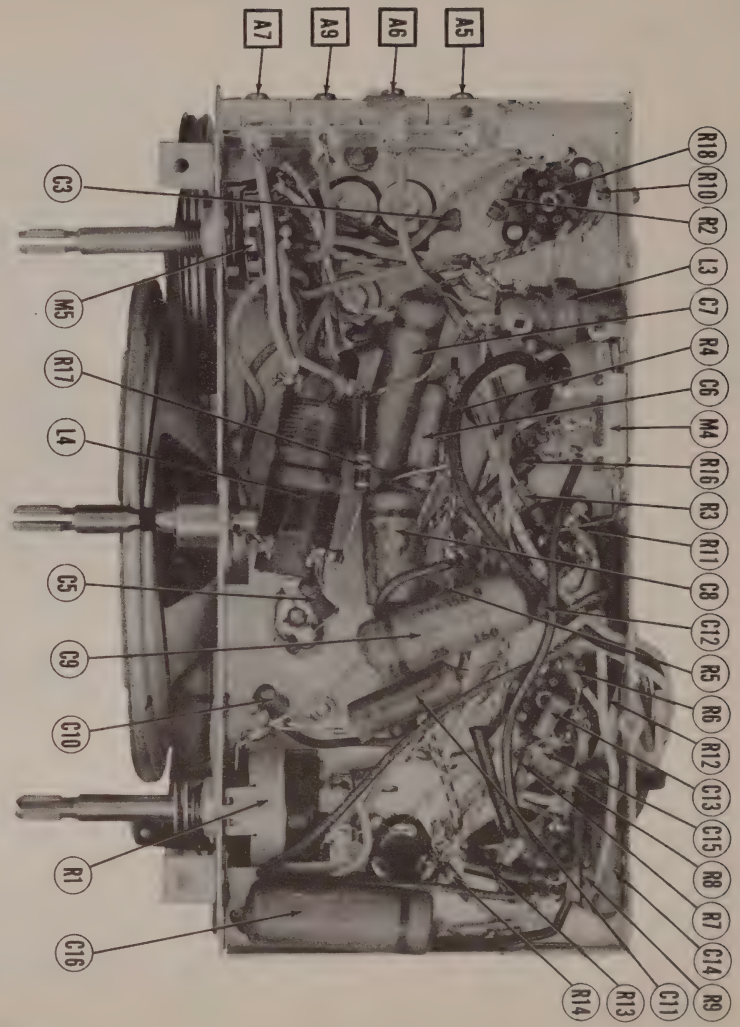
ITEM No.	VOLTAGE	DEWALD PART No.	REPLACEMENT DATA: EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M2	9V "A"		746			G3			2 required
M3	90V "B"			482			M30		2 required

MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M4	Switch	8019	AC/DC-Battery
M5	Switch	8017B-6	Band
M6	2 Gang Var.-Cap.	2014-5	(13-452MMF, 13-452MMF)
A5	Trimmer Strip	2057	BC Osc. Adj.
A6			BC Osc. Padder
A7			SW #1 Osc. Adj.
A9			SW #2 Osc. Adj.
	Cabinet	4134	
	Dial Scale	6042	



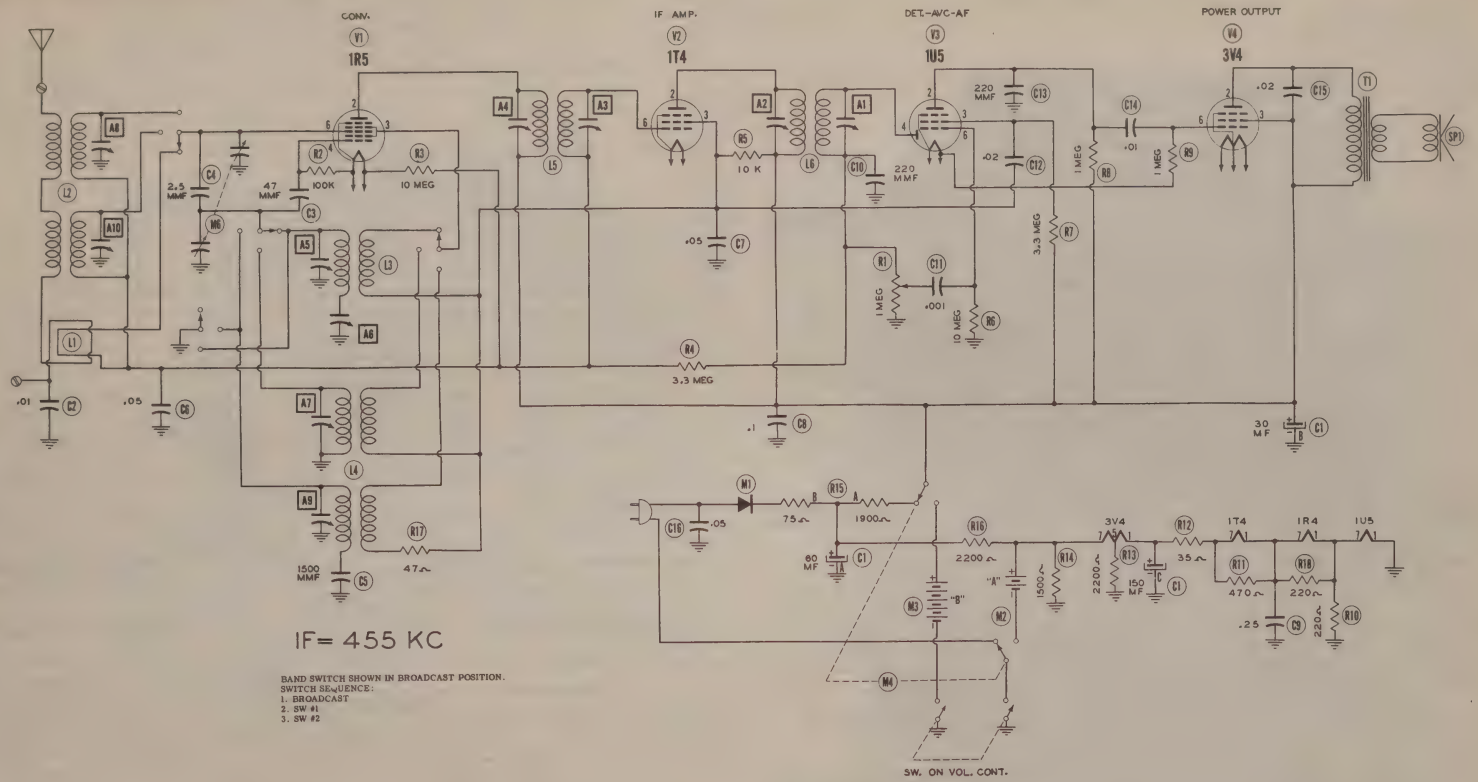
CHASSIS—BOTTOM VIEW



SET 106 FOLDER 5

DEWALD MODEL D-508

DEWALD MODEL D-508



V & R TAKEN IN AC/DC POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	1.4VDC	85VDC	60VDC	§-5.3VDC	1.4VDC	.1VDC	2.8VDC
V 2	1T4	2.8VDC	85VDC	60VDC	0V.	2.8VDC	.1VDC	4.2VDC
V 3	1U5	0V.	7.2VDC	5.5VDC	-.2VDC	0V.	0V.	1.4VDC
V 4	3V4	6.2VDC	80VDC	85VDC	1.4VDC	7.5VDC	.3VDC	9VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†2.2KΩ	†12KΩ	100KΩ	*	4.3 Meg.	*
V 2	1T4	*	†2.2KΩ	†12KΩ	Inf.	*	4.3 Meg.	*
V 3	1U5	*	†1 Meg.	†3.3 Meg.	1 Meg.	Inf.	10 Meg.	*
V 4	3V4	*	#2.9Ω	†2.2KΩ	*	*	1 Meg.	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

DUMONT MODELS

RA-111A (PUTNAM, GUILFORD)

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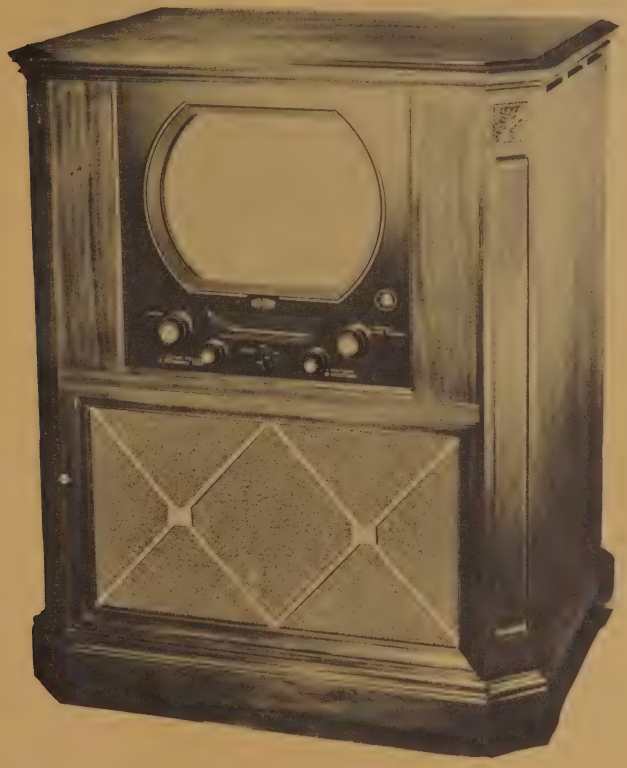

RA-111A "GUILFORD"

DUMONT MODELS

RA-111A (PUTNAM, GUILFORD)

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DUMONT
MODEL RA-111A

DUMONT MODEL RA-111A "GUILFORD"

TRADE NAME	Dumont Model RA-111A "Guilford" or "Putnam"
MANUFACTURER	Allen B. Dumont Laboritories, 2 Main Ave., Passiac, New Jersey
TYPE SET	Television Receiver
TUBES	Twenty Five
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	2.1 Amp. at 117 Volts AC
TUNING RANGE	44 thru 216MC (Continuous Tuning)

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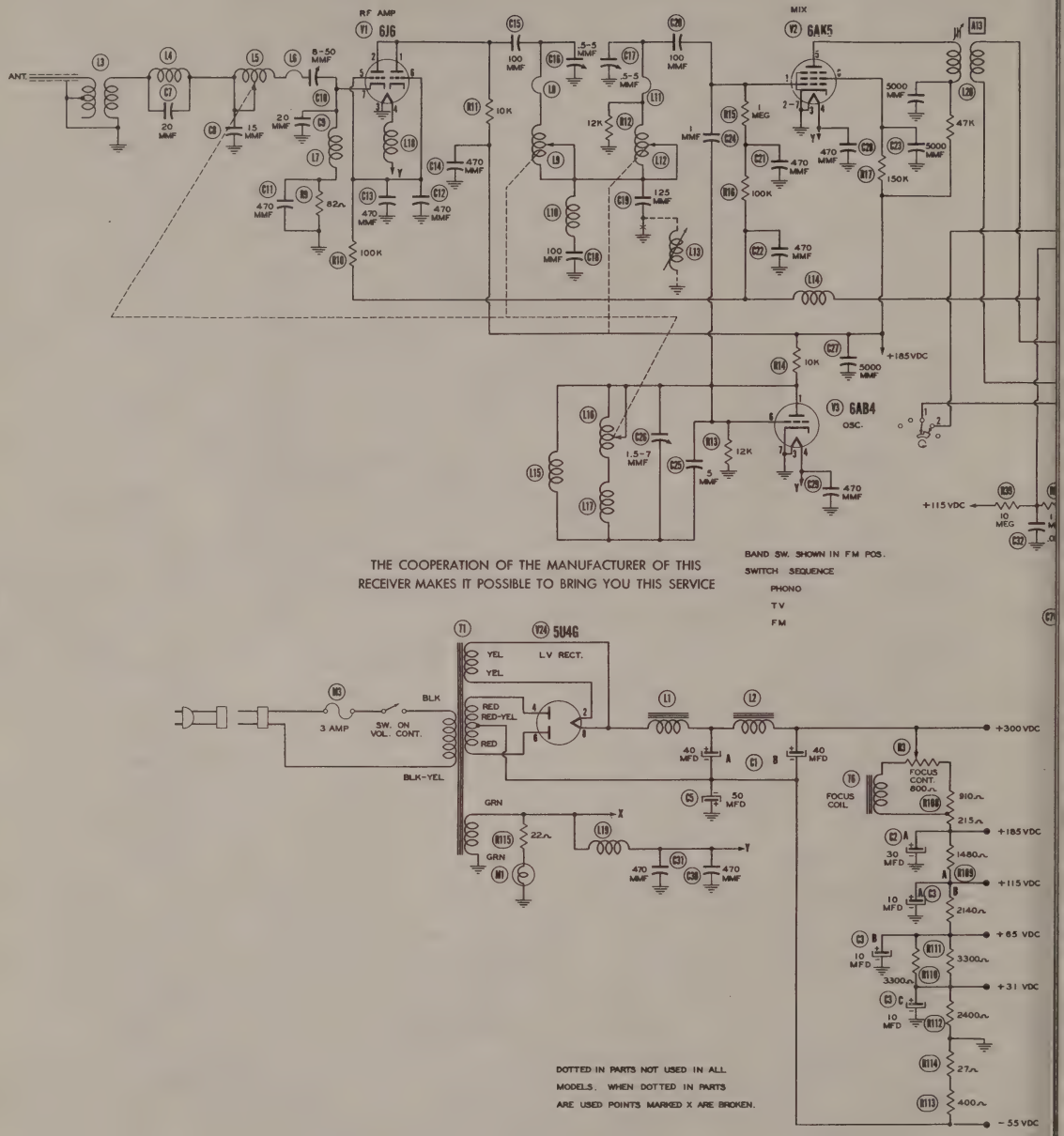

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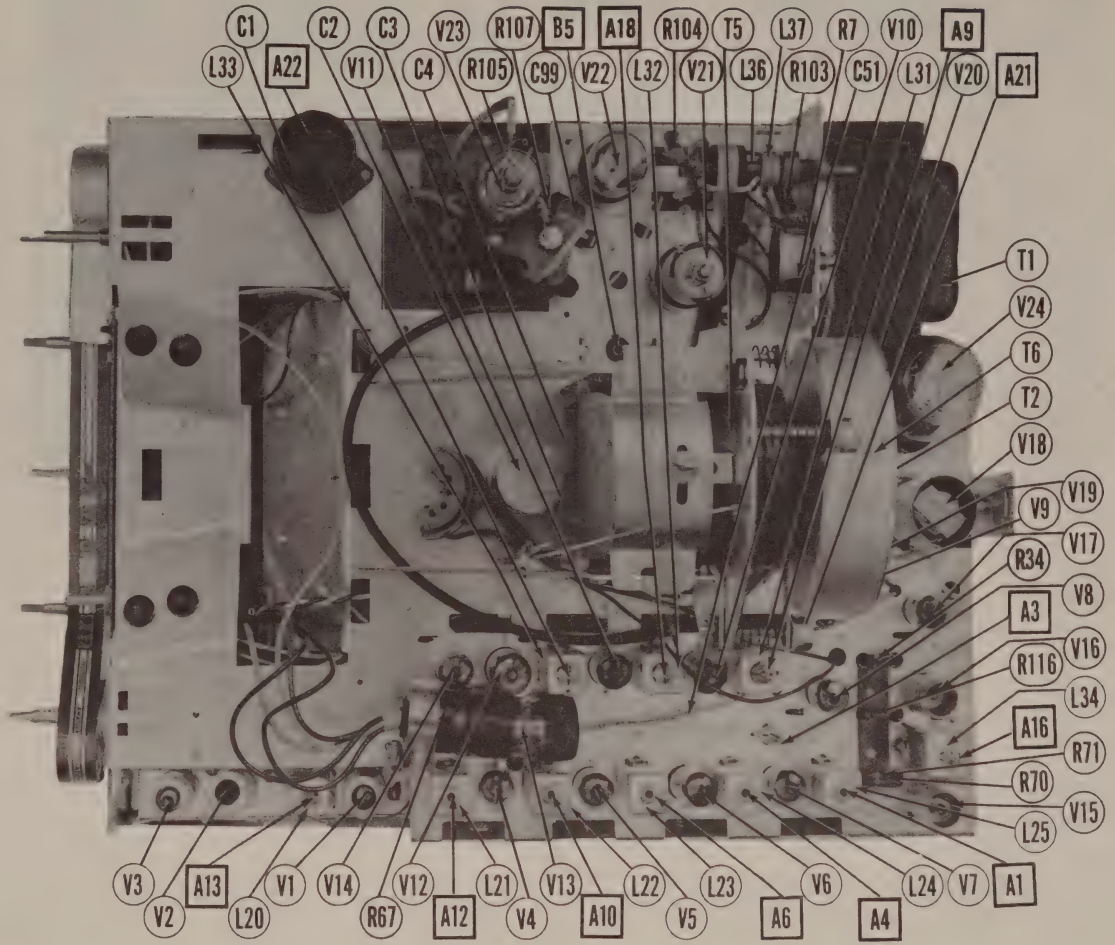
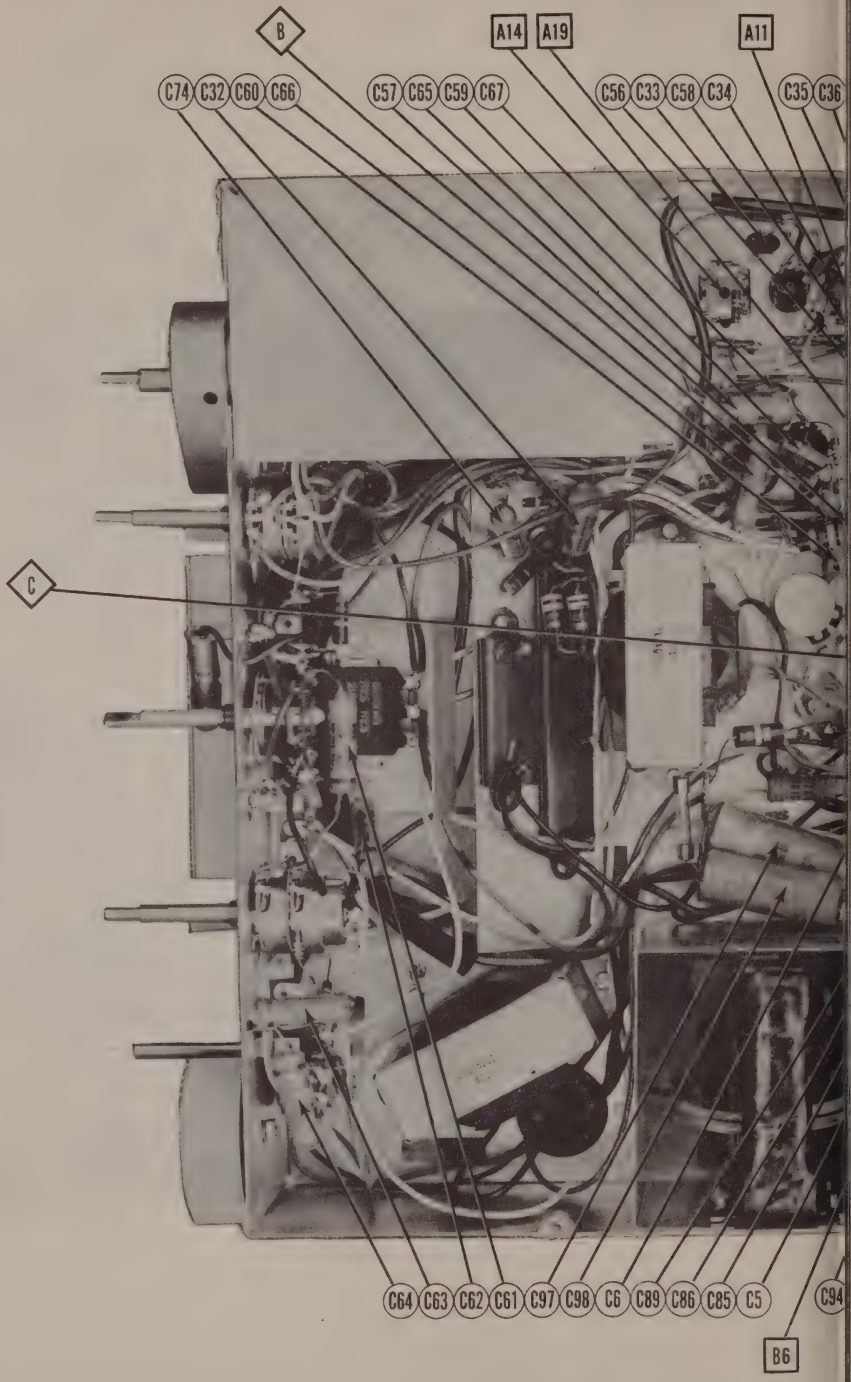
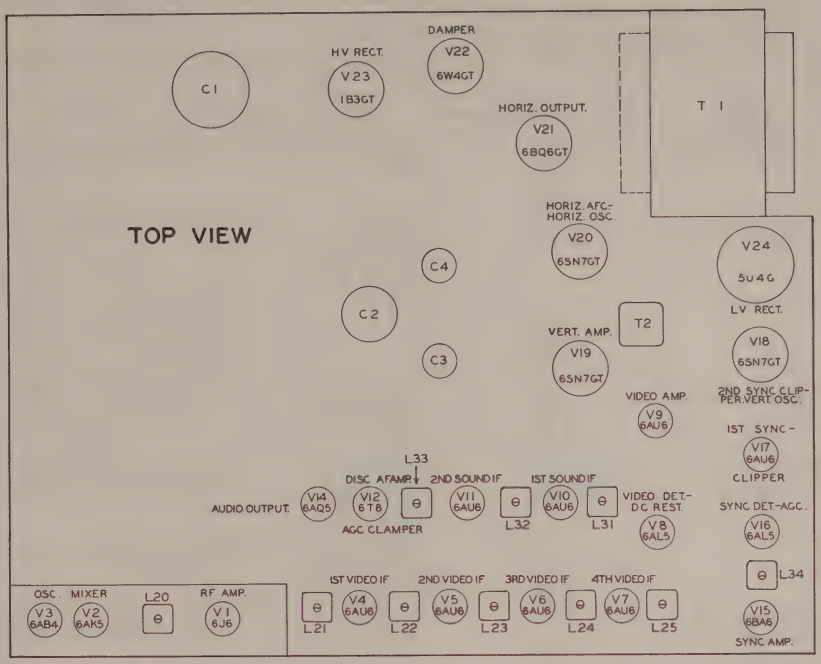
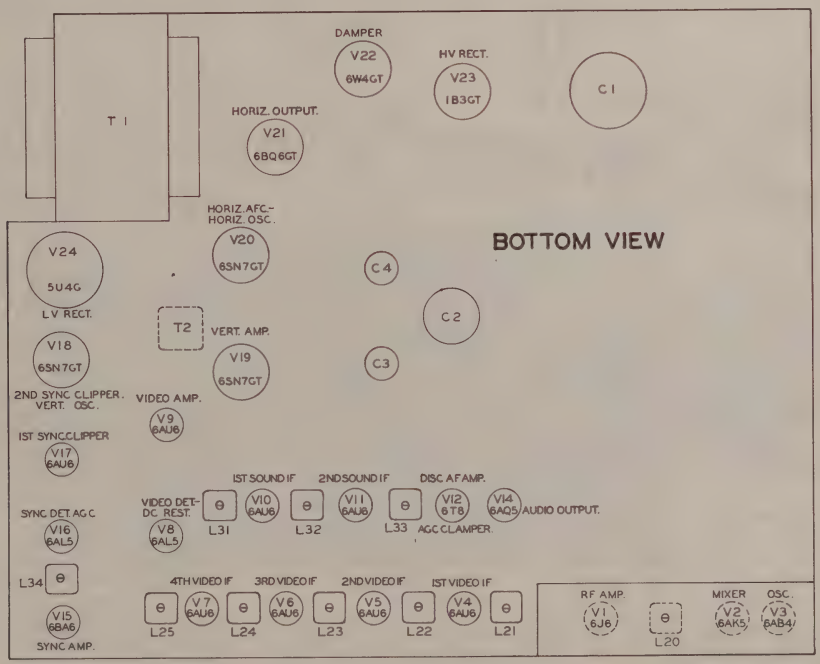


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPA





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard remove the damper tube (V22) from its socket.

VIDEO IF ALIGNMENT

Remove the local oscillator tube V3 from its socket to prevent erroneous indications.
Remove the sync amplifier tube V17 and replace with a 6AU6 with pins 3 and 4 removed.
Turn the function switch to TV position (2nd position clockwise).
The coupling loop in the mixer transformer L20 controls the bandwidth of the 1st stage of Video IF. This is adjusted and sealed in position at the factory and should not be touched, except when the RF tuner is replaced, in which case it should be adjusted for response curve as in step 8 of alignment.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	100MMF	High side to pin 1 (Grid) of 6AU6 (V7). Low side to chassis.	24MC (10MC SWP)	21.9MC 22.4MC 22.9MC 25.65MC 26.4MC	Any	Vert. Amp. to Point (A) Low side to chassis.	A1, A2,	Adjust for response curve similar to figure 1 with markers as shown.
2.	100MMF	High side to pin 1 (Grid) of 6AU6 (V6). Low side to chassis.	Not used	21.9MC (400 ∿ Mod.)	"	Vert. Amp. thru detector probe as shown in figure 10. to pin 5 (plate) of 6AU6 (V7). Low side to chassis.	A3	Adjust for MINIMUM 400 ∿ indication on scope.
3.	100MMF	"	24MC (10MC SWP)	22.4MC 22.9MC 25.65MC 26.4MC	"	"	A4, A5	Adjust for response curve similar to figure 2 with marker as shown.
4.	100MMF	High side to pin 1 (Grid) of 6AU6 (V5). Low side to chassis.	"	21.9MC 22.4MC 22.9MC 25.65MC 26.4MC	"	Vert. Amp. thru detector probe to pin 5 (plate) of 6AU6 (V6). Low side to chassis.	A6, A7	Adjust for response curve similar to figure 3 with markers as shown.
5.	100MMF	High side to pin 1 (Grid) of 6AU6 (V4). Low side to chassis.	21.9MC (1MC SWP)	21.8MC 21.9MC 22MC	"	High side thru detector probe to pin 5 (plate) of 6AU6 (V10). Low side to chassis.	A8, A9	Adjust for response curve similar to figure 4 with markers as shown.
6.	100MMF	"	24MC (10MC SWP)	21.9MC 22.4MC 22.9MC 25.65MC 26.4MC	"	High side thru detector probe to pin 5 (plate) of 6AU6 (V5). Low side to chassis.	A10, A11	Adjust for response curve similar to figure 5 with markers as shown.
7.	100MMF	High side touungrounded tube shield floating over mixer tube (V2). Low side to chassis.	Not used	27.9MC (400 ∿ Mod.)	"	High side thru detector probe to pin 5 (plate) of 6AU6 (V4). Low side to chassis.	A12	Adjust for MINIMUM 400 ∿ indication on scope.
8.	100MMF	"	24MC (10MC SWP)	21.9MC 22.4MC 22.9MC 25.65MC 26.4MC	"	Vert. Amp. thru detector probe to pin 5 (plate) of 6AU6 (V4). Low side to chassis.	A13, A14	Adjust for response curve similar to figure 6 with markers as shown.
9.	100MMF	High side to pin 1 (Grid) of 6AU6 (V7). Low side to chassis.	24MC (2MC SWP)	25.65MC 26.4MC	"	Vert. Amp. to pin 1 (Grid) of 6AU6 (V17). Low side to chassis.	A15, A16	Adjust for response curve similar to figure 7 with markers as shown.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	100MMF	High side to pin 1 (Grid) of 6AU6 (V10). Low side to chassis.	21.9MC (1MC SWP)	21.8MC 21.9MC 22MC	Any	Vert. Amp. thru detector probe to pin 5 (plate) of 6AU6 (V11). Low side to chassis.	A17, A18	Adjust for maximum amplitude and symmetry as per figure 8.
11.	100MMF	"	"	"	"	Vert. Amp. to Point (B) Low side to chassis.	A19, A20	Adjust A20 to place 21.9MC at center of diagonal line as per figure 9. Adjust A19 for maximum amplitude and straightness of diagonal line.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	100MMF	High side to pin 7 (plate) of 6AL5 (V8). Low side to chassis.	Not used	4.5MC (400 ∿ Mod.)	Any	Vert. Amp. thru detector probe to point (C) Low side to chassis.	A21	Adjust for minimum 400 ∿ indication on scope. After alignment is complete, tune in a test pattern and adjust for maximum vertical wedge definition.

THE RF TUNER PORTION OF THIS RECEIVER HAS BEEN ALIGNED AT THE FACTORY AND IS VERY STABLE AND WILL NOT NORMALLY REQUIRE ADJUSTMENT IN THE FIELD.

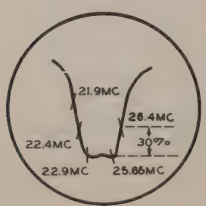


FIG. 1

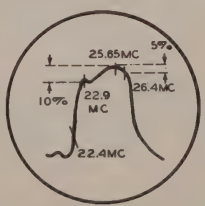


FIG. 2

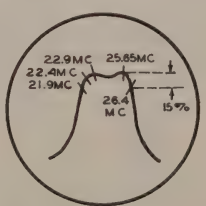


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

FIG.4

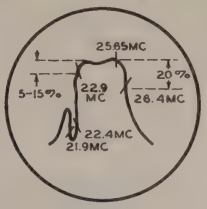


FIG.5

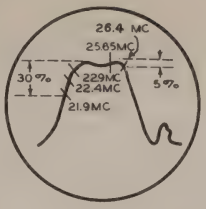


FIG.6

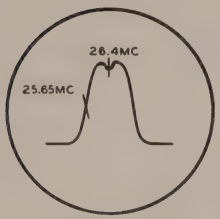


FIG. 7

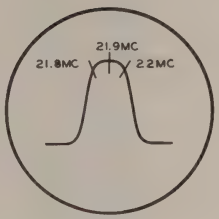


FIG. 8

FIG. 9

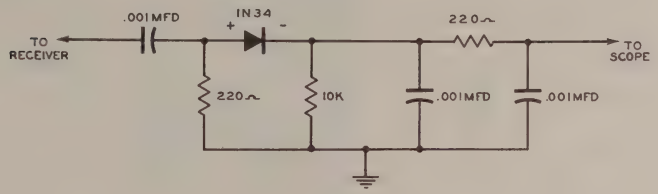
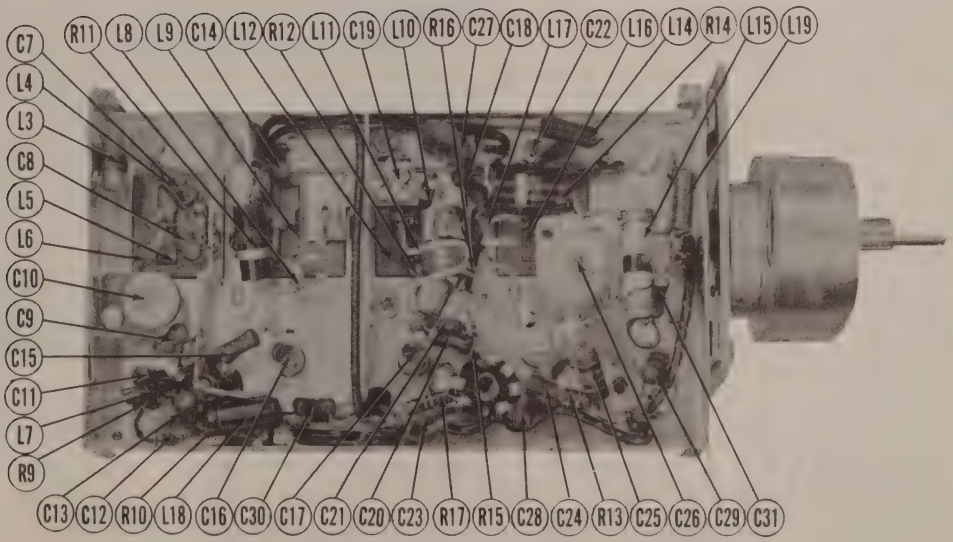


FIG.10



RF TUNER

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	90VDC	90VDC	0V.	6.3VAC	-.2VDC	-.2VDC	.8VDC		
V 2	6AK5	-2VDC	0V.	0V.	6.3VAC	55VDC	60VDC	0V.		
V 3	6AB4	130VDC	0V.	0V.	6.3VAC	0V.	§-4.4VDC	0V.		
V 4	6AU6	-.4VDC	0V.	0V.	6.3VAC	185VDC	135VDC	.3VDC		
V 5	6AU6	-.4VDC	0V.	0V.	6.3VAC	185VDC	135VDC	.5VDC		
V 6	6AU6	0V.	0V.	0V.	6.3VAC	175VDC	115VDC	.9VDC		
V 7	6AU6	0V.	0V.	0V.	6.3VAC	185VDC	115VDC	1VDC		
V 8	6AL5	0V.	-50VDC	0V.	6.3VAC	-30VDC	0V.	-.6VDC		
V 9	6AH6	-.6VDC	0V.	0V.	6.3VAC	280VDC	250VDC	4.8VDC		
V 10	6AU6	-.4VDC	0V.	0V.	6.3VAC	185VDC	115VDC	.4VDC		
V 11	6AU6	-3.4VDC	0V.	0V.	6.3VAC	185VDC	115VDC	0V.		
V 12	6T8	-2VDC	-2VDC	.3VDC	6.3VAC	0V.	-.4VDC	0V.	-.6VDC	65VDC
V 13	6AL7GT	.8VDC	6.3VAC	160VDC	0V.	0V.	0V.	0V.	.8VDC	
V 14	6AQ5	0V.	6.2VDC	6.3VAC	0V.	130VDC	135VDC	0V.		
V 15	6BA6	0V.	0V.	0V.	6.3VAC	180VDC	115VDC	3VDC		
V 16	6AL5	60VDC .2VDC	60VDC .2VDC	0V.	6.3VAC	70VDC 2VDC	0V.	-.1VDC		
V 17	6AU6	-3.6VDC	0V.	0V.	6.3VAC	25VDC	32VDC	0V.		
V 18	6SN7GT	-80VDC -90VDC	110VDC 2VDC	-55VDC	-55VDC	15VDC	-55VDC	6.3VAC	0V.	
V 19	6SN7GT	-30VDC	260VDC	-40VDC -45VDC	-30VDC	260VDC	-40VDC -45VDC	0V.	6.3VAC	
V 20	6SN7GT	-65VDC	45VDC	-75VDC	-130VDC	210VDC	-55VDC	6.3VAC	0V.	
V 21	6BQ6GT	0V.	0V.	0V.	70VDC	-57VDC	-57VDC	6.3VAC	-45VDC	TOP CAP *
V 22	6W4GT	0V.	0V.	370VDC	370VDC	300VDC	370VDC	6.3VAC	0V.	
V 23	1B3GT	* DO NOT MEASURE.								
V 24	5U4G	0V.	325VDC	0V.	320VAC	0V.	320VAC	0V.	325VDC	
V 25	12QP4	0V.	-30VDC	PIN 10 300VDC	PIN 11 65VDC	PIN 12 6.3VAC				

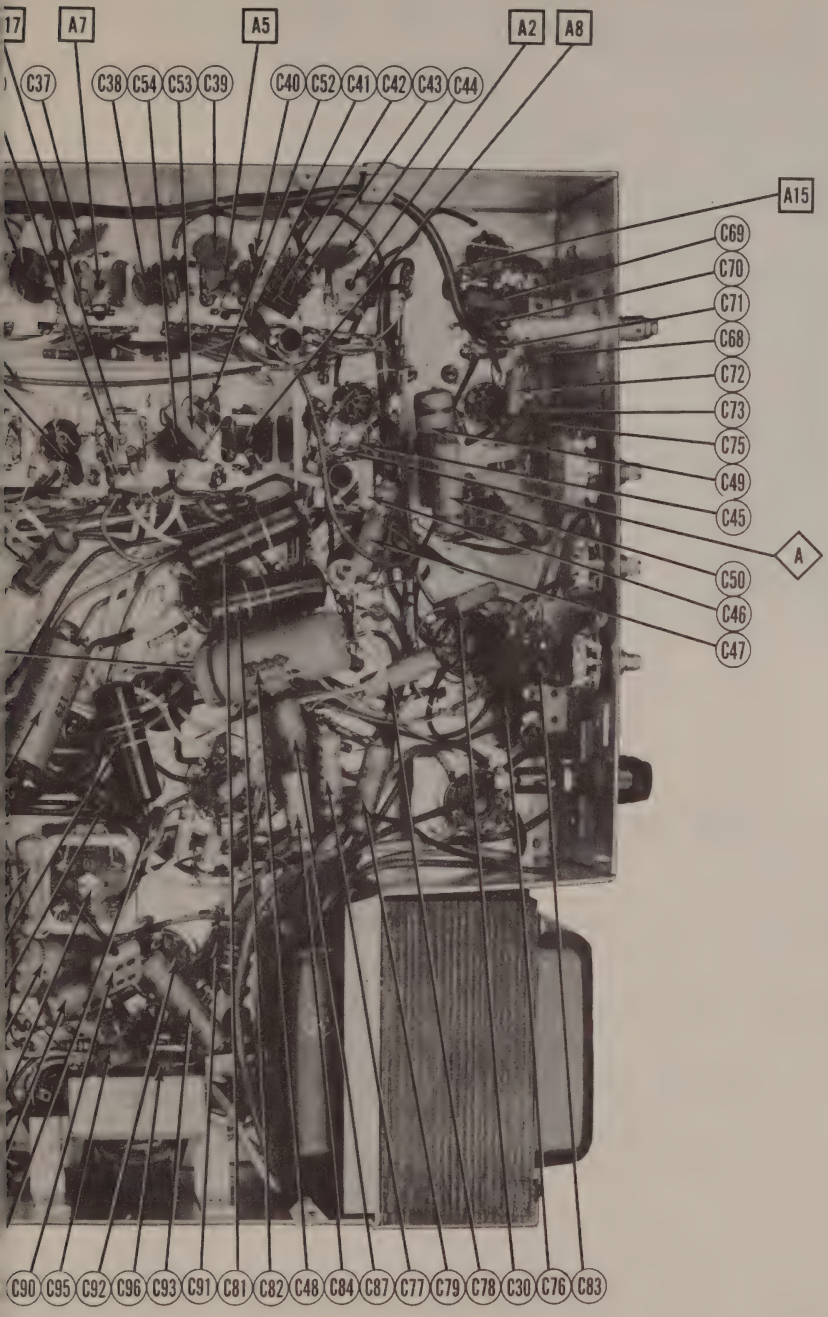
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	†11KΩ	†11KΩ	0Ω	.1Ω	1.5 Meg.	1.5 Meg.	82Ω		
V 2	6AK5	2.5 Meg.	0Ω	0Ω	.1Ω	†48KΩ	†150KΩ	0Ω		
V 3	6AB4	†11KΩ	Inf.	0Ω	.1Ω	Inf.	12KΩ	0Ω		
V 4	6AU6	1.5 Meg.	0Ω	0Ω	.1Ω	†1.8KΩ	†10KΩ	39Ω		
V 5	6AU6	1.5 Meg.	0Ω	0Ω	.1Ω	†1.8KΩ	†10KΩ	39Ω		
V 6	6AU6	.7Ω	0Ω	0Ω	.1Ω	†3.5KΩ	†3.2KΩ	120Ω		
V 7	6AU6	6.8KΩ	0Ω	0Ω	.1Ω	†1.8KΩ	†3.2KΩ	120Ω		
V 8	6AL5	.5Ω	100KΩ	0Ω	.1Ω	1 Meg.	0Ω	4.3KΩ		
V 9	6AH6	4.3KΩ	0Ω	0Ω	.1Ω	†4.4KΩ	†66KΩ	1000Ω		
V 10	6AU6	800KΩ	0Ω	0Ω	.1Ω	†1.8KΩ	†3.2KΩ	39Ω		
V 11	6AU6	270KΩ	0Ω	0Ω	.1Ω	†1.8KΩ	†3.2KΩ	0Ω		
V 12	6T8	100KΩ	100KΩ	200KΩ	.1Ω	0Ω	1.7 Meg.	0Ω	10 Meg.	†330KΩ
V 13	6AL7GT	3.3KΩ	.1Ω	†800Ω	1.5 Meg.	0Ω	0Ω	0Ω	3.3KΩ	
V 14	6AQ5	470KΩ	270Ω	.1Ω	0Ω	†3KΩ	†2.7KΩ	470KΩ		
V 15	6BA6	.5Ω	0Ω	0Ω	.1Ω	†1.8KΩ	†3.2KΩ	340Ω		
V 16	6AL5	1000Ω 4.5KΩ	1000Ω 4.5KΩ	0Ω	.1Ω	19KΩ 25KΩ	0Ω	800KΩ		
V 17	6AU6	1.2 Meg.	0Ω	0Ω	.1Ω	†28KΩ	†5.9KΩ	0Ω		
V 18	6SN7GT	1.7 Meg. 2.7 Meg.	†910KΩ †4.9 Meg.	590Ω 2.5KΩ	1.2 Meg.	†8.6KΩ	430Ω 2.5KΩ	.1Ω	0Ω	
V 19	6SN7GT	2.2 Meg.	†5.6KΩ	1000Ω	2.2 Meg.	†5.6KΩ	1000Ω	0Ω	.1Ω	
V 20	6SN7GT	850KΩ	#180KΩ	300KΩ	250KΩ	#60KΩ	430Ω	.1Ω	0Ω	
V 21	6BQ6GT	Inf.	0Ω	Inf.	†6.2KΩ	470KΩ	470KΩ	.1Ω	530Ω	TOP CAP #60Ω
V 22	6W4GT	Inf.	Inf.	160KΩ	#2.9Ω	†80Ω	#2.9Ω	.1Ω	0Ω	
V 23	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #400Ω
V 24	5U4G	Inf.	8000Ω	Inf.	450Ω	Inf.	450Ω	Inf.	8000Ω	
V 25	12QP4	0Ω	1 Meg.	PIN 10 †70Ω	PIN 11 80KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 8 OF V24.
# MEASURED FROM PIN 3 OF V22.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



TOR AND ALIGNMENT IDENTIFICATION

HORIZONTAL OSCILLATOR ADJUSTMENTS

Turn the horizontal locking range trimmer (B4) fully clockwise. Turn the horizontal waveform slug B5 fully counter-clockwise and then four turns clockwise.

Turn the horizontal hold control fully clockwise and adjust horizontal frequency slug B6 until the picture "syncs."

Connect the vertical input lead of an oscilloscope to terminal C of L35. The pattern on the scope should be similar figure 11. Adjust B5 until the broad and narrow peaks are of the same amplitude.

Remove the scope and with the hold control still fully clockwise, adjust B6 until picture is phased as far to the right as possible without instability or "geartooth" effect appearing. Some blanking must appear at left side of picture.

Check to see if picture holds "sync" while turning the hold control fully counter-clockwise. If it does not hold sync over the full range of the control it may be necessary to repeat this procedure. Momentarily remove signal by tuning to another channel and back to original again. It is normal in this circuit to lose "sync" when this is done. There should be 4 or 5 slanting horizontal blanking bars visible. If there are more than 5 bars present, turn B4 slightly clockwise. If less than 4 bars are present, turn B5 slightly counter-clockwise. Momentarily remove signal and recheck number of bars present at the pull-in point. Repeat this procedure until 4 or 5 bars are present just before synchronization occurs.

Turn the horizontal hold control fully clockwise. The picture should be just out of synchronization to the extent that the horizontal blanking bar appears as a single vertical or diagonal bar in the picture. Retouch B6 until this condition exists.

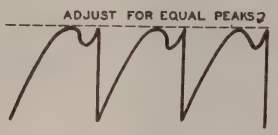
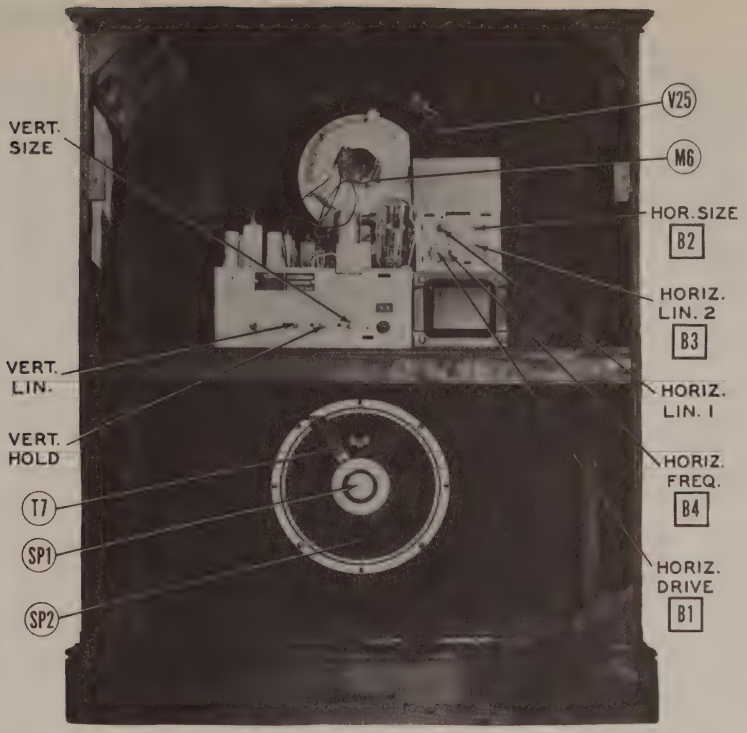


FIG. 11

AGC ADJUSTMENT

Remove the AGC detector tube V16 from its socket. Connect the DC probe of a VTVM to pin 2 of V16 and adjust the AGC control R8 so that a reading of 18 volts is made.



CABINET–REAR VIEW

HORIZONTAL LINEARITY, DRIVE AND SIZE ADJUSTMENTS

Turn the set on and tune in a TV station preferably a test pattern, and sync picture if possible with horizontal hold.

Turn the horizontal drive trimmer (B1) clockwise as far as possible without crowding the right side of the picture. Adjust the horizontal size slug (B2) until picture fills the mask horizontally.

Turn the horizontal linearity (2) slug (B3) all the way out of coil. Turn the horizontal linearity (1) control R7 fully counter-clockwise. Adjust the horizontal hold control until the leading edge of the sync pulse is at the extreme right side of side of the raster.

Turn horizontal linearity B3 in until "squeezing" of the right edge of picture is observed. Adjust horizontal linearity control R7 for best linearity from left to right. Turn linearity slug B3 in another turn or until "squeezing" is just seen in the right side of the picture. A slight adjustment of B1 may be necessary for optimum results.

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DUMONT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	25000190	6J6	7BF	
V2	Mixer	25000180	6AK5	7BD	
V3	Oscillator	25001760	6AB4	5CE	
V4	1st Video IF	25000050	6AU6	7BK	
V5	2nd Video IF	25000050	6AU6	7BK	
V6	3rd Video IF	25000050	6AU6	7BK	
V7	4th Video IF	25000050	6AU6	7BK	
V8	Video Det. -DC Rest.	25000020	6AL5	6BT	
V9	Video Amp.	25001510	6AH6	7BK	
V10	1st Sound IF	25000050	6AU6	7BK	
V11	2nd Sound IF	25000050	6AU6	7BK	
V12	Disc.-AF Amp.-AGC Clamp.	25001820	6T8	9E	
V13	Tuning Indicator	25000200	6AL7GT	8CH	
V14	Audio Output	25000340	6AQ5	7BZ	
V15	Sync. Amp.	25000240	6BA6	7BK	
V16	Sync. Det.-AGC	25000020	6AL5	6BT	
V17	1st Sync. Clipper	25000050	6AU6	7BK	
V18	2nd Sync. Clipper -Vert. Osc.	25000110	6SN7GT	8BD	
V19	Vert. Amp.	25000110	6SN7GT	8BD	
V20	Hor. AFC-Hor. Osc.	25000110	6SN7GT	8BD	
V21	Hor. Output	25001830	6BQ6GT	6AM	
V22	Damper	25000830	6W4GT	4CG	
V23	HV Rect.	25000150	1B3GT	3C	
V24	LV Rect.	25000060	5U4G	5T	
V25	Picture Tube	25000330	12QP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DUMONT PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	03014130	AF88J		UP4445		TVL-2764	▲ Filter
B	40	450							▲ Filter
C2A	30	450	03018450	AFH8422J		UPT31145		TVL-4766	▲ Filter
B	10	450				-125			■ V. Amp. Screen
C	10	450							▲ Output Decoup.
D	10	250							Decoupling
C3A	10	450	03018440	AFH222J		UP11145		TVL-3776	■ Filter
B	10	350							▲ Filter
C	10	250							Filter
C4A	30	450	03019400	AFH42J8B		UP3045V		TVL-1720	■ Decoupling
B	25	50				2		TVA-1306	▲ Vert. Output Cath.
C5	50	150	03018430	PRS250/40		BR5015A		TVA-1414	Filter
C6	10	450	03019410	PRS450/10		BR1045A		TVA-1705	Decoupling
C7	20		03015790	SI20KNPO	TCZ-20		NPOK-20		Fixed Trimmer
C8	15		03012050	SI15KNPO	TCZ-15		NPOK-15		Fixed Trimmer
C9	20		03015790	SI20KNPO	TCZ-20		NPOK-20		Fixed Trimmer
C11	8-50		03017500				557-N750-8-50		Variable Trimmer
C11	470		03016470	GP470M	D6-471		GP2K-470		RF Cath. Bypass
C12	470		03016470	GP470M	D6-471		GP2K-470		RF Grid Bypass
C13	470		03016470	GP470M	D6-471		GP2K-470		RF Grid Bypass
C14	470		03016470	GP470M	D6-471		GP2K-470		RF Bypass
C15	100		03016700	GP100M	D6-101		GP1K-100		RF Coupling
C16	.5-5		03016650				503-08-.5-5		Variable Trimmer
C17	.5-5		03016650				503-08-.5-5		Variable Trimmer
C18	100		03016700	GP100M	D6-101		GP1K-100		Fixed Trimmer
C19	125		03018020						Fixed Trimmer
C20	100		03016700	GP100M	D6-101		GP1K-100		RF Coupling
C21	470		03016470	GP470M	D6-471		GP2K-470		AGC Filter
C22	470		03016470	GP470M	D6-471		GP2K-470		AGC Filter
C23	5000		03015610	BPD-005	DD-502		811-005	29C1	Mixer Screen
C24	1		03012150		TCZ-1				Osc. Coupling
C25	5		03014730	SI5DNPO	TCZ-4.7		NPOK-5		Osc. Grid Cap.
C26	1.5-7		03016870				TS2A-N300-1.5-7		Variable Trimmer
C27	5000		03015610	BPD-005	DD-502		811-005	29C1	RF Bypass
C28	470		03016470	GP470M	D6-471		GP2K-470		Mixer Fil. Bypass
C29	470		03016470	GP470M	D6-471		GP2K-470		Osc. Fil. Bypass
C30	470		03016470	GP470M	D6-471		GP2K-470		Filament Bypass
C31	470		03016470	GP470M	D6-471		GP2K-470		Filament Bypass
C32	.05	200	03000950	P288-05	DF-503	PTE4S5		TM-15-2	AGC Filter
C33	5000		03015610	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C34A	4000		03017790	BPD-2x004	DD-2-502	1D5D4	882-2x004	36C2	1st V. IF Screen
B	4000					1D5D4			1st V. IF Plate Dec.
C35	.05	200	03000950	P288-05	DF-503	PTE4S5		TM-15-2	AGC Filter
C36	5000		03015610	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C37A	4000		03017790	BPD-2x004	DD-2-502	1D5D4	882-2x004	36C2	2nd V. IF Screen
B	4000					1D5D4			2nd V. IF Plate Dec.
C38	5000		03015610	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Cath.
C39A	4000		03017790	BPD-2x004	DD-2-502	1D5D4	882-2x004	36C2	3rd V. IF Screen
B	4000					1D5D4			3rd V. IF Plate Dec.
C40	5000		03015610	BPD-005	DD-502	1D5D5	811-005	29C1	IF Coupling
C41	20	500	03055000		TCZ-20	5R5Q2	NPOK-20	MS-42	Fixed Trimmer
C42	100	500	03055170	1469-0001	TCZ-100	5R5T1	NPOM-100	MS-31	Fixed Trimmer
C43	5000		03015610	BPD-005	DD-502	1D5D5	811-005	29C1	4th V. IF Cath.
C44A	4000		03017790	BPD-2x004	DD-2-502	1D5D4	882-2x004	36C2	4th V. IF Screen
B	4000					1D5D4			4th V. IF Plate Dec.
C45	5	500	03055500	1469-000005	TCZ-4.7	5R5V5	NPOK-5	MS-55	V. Diode Filter
C46	47		03012730	GP47K	TCZ-47	5R5Q5	NPOM-50	MS-45	Fixed Trimmer
C47	.005	600	03001570	P688-005	D6-502	PTE6D5	811-005	TM-25	V. Amp. Cath.
C48	.5	400	03014260	484-5		GT4P5		TM-5-4	Video Coupling
C49	.05	600	03015370	P688-05	DF-503	PTE6S5		TM-15	Video Coupling
C50	.05	200	03000950	P288-05	DF-503	PTE4S5		TM-15-2	DC Res. Cath. Byp.
C51	2.5		03016897						S. IF Coupling †
C52	5000		03015610	BPD-005	DD-502	1D5D5	811-005	29C1	AVC Filter
C53	1000	500	03033180	1467-001	D6-102	1W5D1	GP2L-001	1FM-21	1st S. IF Screen
C54	5000		03015610	BPD-005	DD-502	1D5D5	811-005	29C1	1st S. IF Plate Dec.
C55	10	500	03020000	1468-00001	D6-100	5W5Q1	GP1K-10	MS-41	S. IF Coupling
C56	5000		03015610	BPD-005	DD-502	1D5D5	811-005	29C1	AVC Filter
C57	.05	200	03000950	P288-05	DF-503	PTE4S5		TM-15-2	AVC Filter

CAPAC

ITEM No.	RATING: CAP.	RATING: VOLT	REPLAC: DUMONT PART No.	REPLAC: AEROVOX PART No.	REPLAC: CENT PAR
C58A	4000		03017790	BPD-2x004	DD-
B	4000				
C59	47	500	03020080	1468-00005	D6-
C60	680	500	03020210	1468-00075	D6-
C61	.01	400	03014900	P488-01	D6-
C62	.01	400	03001450	P488-01	D6-
C63	.01	400	03014900	P488-01	D6-
C64	.05	200	03000950	P288-05	DF-
C65	.01	600	03012560	P688-01	D6-
C66	.005	600	03001570	P688-005	D6-
C67	27	500	03020360	1468-000025	D6-
C68	.05	200	03000950	P288-05	DF
C69	820	500	03020580	1467-00075	D6-
C70	5000		03015610	BPD-005	DD
C71	5000		03015610	BPD-005	DD
C72	33	500	03020060	1468-00004	D6-
C73	150	500	03020140	1468-00015	D6-
C74	.001	600	03019440	P688-001	D6-
C75	.1	200	03014780	P288-1	DF
C76	.1	400	03014770	P488-1	DF
C77	.002	600	03014430	P688-002	D6-
C78	.0047	400	03018640	P688-0047	D6-
C79	.02	200	03018470	P488-02	DF
C80	3000	500	03033290	1467-.003	D6-
C81	.1	600	03014820	P688-1	
C82	.1	600	03014820	P688-1	DF-
C83	180	500	03021430	1469-0002	D6-
C84	.002	600	03014430	P688-002	D6-
C85	.02	400	03018350	P488-02	DF-
C86	.2	400	03018330	P488-22	
C87	.05	400	03019640	P488-05	DF-
C88	270	500	03021470	1468-00025	D6-
C89	.01	400	03003410	P488-01	
C90	1000	500	03033180	1467-001	D6-
C91	270	500	03021470	1468-00025	D6-
C92	100	500	03055170	1468-0001	D6-
C93	.05	400	03019640	P488-05	DF-
C94	.15	200	03018320	P288-15	
C95	.15	200	03018360	P288-15	
C96	.05	200	03019590	P288-05	DF-
C97	.25	600	03019190	684-25	
C98	.5	200	03002190	P288-5	
C99	500	10000	03014410	HV10A	TVL

* Some models use .005MFD in this application.
† Some models use 1.7MMF in this application.

C

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DUMONT PART No.	REPLACEMENT DATA: IRC PART No.	C F
R1A	100KΩ			Concentrikit	
B	1000Ω		01027000	B11-128 *	
C	Shaft End			B11-108 *	RT
				E-202 *	
R2A	50KΩ			Concentrikit	
B	1 Meg.		01028200	B11-123 *	
C	Shaft End			B13-137 X *	RT
D	Switch			E-202 *	
R3	800Ω	25	01026710	76-1 *	RT
R4	1500Ω	2	01024620	WK-1500	RT
R5A	1 Meg.		01007520	Q11-137	AG
B	Shaft		Not Req.	Not Req.	FK
R6A	4 Meg.		01008570		AG
B	Shaft		Not Req.		FK
R7	500Ω	2	01024820	W-500 †	43-
R8A	25KΩ		01007540	Q11-120	AM
B	Shaft		Not Req.	RQ	FK

* Additional parts to be used with "Concentrikit".
† File slot in shaft to duplicate original.

R

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DUMONT PART No.	REPLACEMENT DATA: IRC PART No.
R9	82Ω		02031640	
R10	100KΩ		02032010	
R11	10KΩ	2	02037890	
R12	12KΩ		02031900	
R13	12KΩ		02031900	
R14	10KΩ	2	02037890	
R15	1 Meg.		02032130	
R16	100KΩ		02032010	
R17	150KΩ		02032030	
R18	10KΩ		02031890	
R19	39Ω		02031600	
R20	1000Ω		02031770	BTS-1000
R21	8200Ω	1	02034880	
R22	1000Ω		02031770	BTS-1000
R23	10KΩ		02031890	
R24	39Ω		02031600	
R25	1000Ω		02031770	BTS-1000
R26	1000Ω		02031770	BTS-1000
R27	1200Ω		02031660	
R28	1000Ω		02031770	BTS-1000
R29	1000Ω		02031770	BTS-1000
R30	6800Ω 5%		02030680	
R31	120Ω		02031660	
R32	1000Ω		02031770	BTS-1000
R33	1000Ω		02031770	BTS-1000
R34	15KΩ		02031910	BTS-15K
R35	680KΩ		02032110	BTS-680K
R36	270KΩ		02032060	BTS-270K
R37	1.2 Meg.		02032140	BTS-1.2 M
R38	1.2 Meg.		02032140	BTS-1.2 M
R39	10 Meg.		02032250	BTS-10 Me

IPTIONS (Continued)

RS (CONT.)

T DATA			
CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
1D5D4	882-2x004	36C2	Limiter Screen
1D5D4			Limiter Plate Dec.
5W5Q5	GP1K-47	1FM-45	RF Bypass
1W5T7	GP2K-680	1FM-37	De-emphasis
PTE4S1	811-01	TM-11-4	Audio Coupling
PTE4S1	811-01	TM-11-4	Audio Coupling
PTE4S1	811-01	TM-11-4	Tone Comp.
PTE4S5		TM-15-2	Tuning Ind. Filter
PTE6S1	811-01	TM-11	Audio Coupling
PTE6D5	811-005	TM-25	Output Plate Byp.
5W5Q25	GP1K-27	MS-425	AF Feedback
PTE4S5		TM-15-2	Sync. Amp. Cath.
1W5T8	GP2K-750	1FM-38	Sync. Amp. Screen
1D5D5	811-005	29C1	Sync. Amp. Plate Dec
1D5D5	811-005	29C1	Decoupling
5W5Q4	GP1K-33	1FM-44	RF Bypass
5W5T15	GP2K-150	1FM-315	RF Bypass
PTE6D1	GP2L-001	TM-21	AGC Filter
PTE4P1		TM-1-2	Sync. Coupling
PTE4P1		TM-1-4	Sync. Coupling
PTE6D2	GP2M-002	TM-22	Integrator Net.
PTE6D5	GP2M-0047	TM-24	Integrator Net.
PTE4S2		TM-12-2	Integrator Net.
1W5D3	GP2M-003	1FM-23	Vert. Osc. Grid
PTE6P1		TM-1	Vert. Discharge
PTE6P1		TM-1	Vert. Sweep Coupling
5R5T2	GP2K-180	MS-32	Hor. Sync. Coupling
PTE6D2	GP2M-002	TM-22	Hor. Sync. Coupling
PTE4S2		TM-12-4	AFC Filter
GT4P2		TM-2-4	AFC Filter
PTE4S5		TM-15-4	Hor. AFC Plate
5W5T25	GP2K-270	1FM-325	Hor. Osc. Grid
PTE4S1		TM-11-4	Fixed Trimmer
1W5D1	GP2L-001	1FM-21	Hor. Discharge
5W5T25	GP2K-270	1FM-325	Hor. Sweep Coupling
5W5T1	GP1K-100	1FM-31	Voltage Divider
PTE4S5		TM-15-4	Hor. Output Screen *
GT2P2		TM-2-2	Hor. Output Cath.
			Damper Filter
PTE4S5		TM-15-2	Damper Filter
GT6P25		TM-2	Damper Filter
GT2P5		TM-5-2	Hor. Sweep Coupling
			HV Filter

ROLS

AT o.	CENTRALAB PART No.	INSTALLATION NOTES
		Brightness control-front
		Contrast control-rear
		Attach per instr. in "Concentrikit".
		Horiz. hold control-front
		Volume control-rear
		Attach per instr. in "Concentrikit".
		Attach per instr. in "Concentrikit".
		Focus control-Wire Wound
	V-129	Vert. linearity control-Wire Wound
	AN-69	Vert. hold control
	AK-1	Attach to R5A per instructions
	AN-86	Vert. size control
	AK-1	Attach to R6A per instructions
	V-127 †	Horiz. linearity #1-Wire Wound
	AN-26	AGC control
	AK-1	Attach to R8A per instructions

TORS

IDENTIFICATION CODES

ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED

RF Amp. Cathode
AGC Network
RF Amp. Plate
Mixer Coil Shunt
Osc. Grid
Osc. Plate
AGC Network
AGC Network
Mixer Screen
AGC Network
1st Video IF Amp. Cathode
1st Video IF Amp. Screen
Decoupling
1st Video IF Amp. Plate Decoupling
AGC Network
2nd Video IF Amp. Cathode
2nd Video IF Amp. Screen
2nd Video IF Amp. Plate Decoupling
3rd Video IF Amp. Cathode
3rd Video IF Amp. Screen
3rd Video IF Amp. Plate Decoupling
4th Video IF Amp. Grid
4th Video IF Amp. Cathode
4th Video IF Amp. Screen
4th Video IF Amp. Plate Decoupling
AGC Network
AGC Network
Voltage Divider
AGC Network
AGC Network
AGC Network

RESISTORS (CONT.)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	DUMONT PART No.	IRC PART No.	
R40	4300Ω 5%	½	02030630		Video Det. Diode Load
R41	22Ω	½	02031570	BW-½-22	Video Amp. Cathode
R42	62KΩ 5%	2	02036910		Video Amp. Screen
R43	4300Ω 5%	2	02036630		Video Amp. Plate
R44	180KΩ	1	02035040	BTA-180K	Video Peaking
R45	1 Meg.	½	02032130	BTS-1 Meg.	Picture Tube Grid
R46	100KΩ	½	02032010	BTS-100K	DC Rest. Load
R47	100KΩ	½	02032010	BTS-100K	Picture Tube Cathode
R48	10KΩ	½	02031890	BTS-10K	AGC Network
R49	39Ω	½	02031600		1st Sound IF Amp. Cathode
R50	1000Ω	½	02031770	BTS-1000	1st Sound IF Amp. Screen
R51	1000Ω	½	02031770	BTS-1000	1st Sound IF Amp. Plate Decoupling
R52	1.2 Meg.	½	02032140	BTS-1.2 Meg.	AGC Network
R53	270KΩ	½	02032060		2nd Sound IF Amp. Grid
R54	1000Ω	½	02031770	BTS-1000	2nd Sound IF Amp. Screen
R55	1000Ω	½	02031770	BTS-1000	2nd Sound IF Amp. Plate Decoupling
R56	100KΩ	½	02032010	BTS-100K	Disc. Diode Load
R57	100KΩ	½	02032010	BTS-100K	Disc. Diode Load
R58	100KΩ	½	02032010	BTS-100K	De-emphasis
R59	22KΩ	½	02031930	BTS-22K	Tone Compensation
R60	10 Meg.	½	02032250	BTS-10 Meg.	AF Amp. Grid
R61	330KΩ	½	02032070	BTS-330K	AF Amp. Plate
R62	470KΩ	½	02032090	BTS-470K	Audio Output Grid
R63	270KΩ	½	02031700	BTS-270K	Audio Output Cathode
R64	3900Ω	2	02037840	BT-2-3900	Audio Output Decoupling
R65	3900Ω	2	02037840	BT-2-3900	Audio Output Decoupling
R66	1.2 Meg.	½	02032140	BTS-1.2 Meg.	Tuning Indicator Network
R67	3300Ω	½			Tuning Indicator Grid
R68	68Ω	½	02031630	BW-½-68	Sync. Amp. Cathode
R69	270Ω	½	02031700	BW-½-270	Sync. Amp. Cathode
R70	1000Ω	½	02031770	BTS-1000	Sync. Amp. Screen
R71	1000Ω	½	02031770	BTS-1000	Sync. Amp. Plate Decoupling
R72	18KΩ	½	02031920	BTS-18K	Voltage Divider
R73	10KΩ	½	02031890	BTS-10K	Isolation
R74	1.2 Meg.	½	02032140	BTS-1.2 Meg.	1st Sync. Clipper Grid
R75	22KΩ	½	02031930	BTS-22K	1st Sync. Clipper Plate
R76	1.2 Meg.	½	02032140	BTS-1.2 Meg.	2nd Sync. Clipper Grid
R77	2700Ω	½	02031820	BTS-2700	2nd Sync. Clipper Plate
R78	10KΩ	½	02031890	BTS-10K	Integrator
R79	10KΩ	½	02031890	BTS-10K	Integrator
R80	10KΩ	½	02031890	BTS-10K	Integrator
R81	1.8 Meg. 5%	½	02031260	BTS-1.8 Meg. 5%	Vert. Osc. Grid
R82	910KΩ 5%	½	02031190		Vert. Osc. Plate
R83	4700Ω 5%	½	02030640	BTS-4700-5%	Vert. Peaking-See Note 3
R84	2.2 Meg.	½	02032170	BTS-2.2 Meg.	Vert. Amp. Grid
R85	560Ω	½	02031740	BTS-560	Vert. Amp. Cathode
R86	5000Ω	5	02112340	AB-5000	Decoupling-Wire Wound
R87	2.7 Meg. 5%	1	02034300	BTA-2.7 Meg. 5%	Voltage Divider
R88	820KΩ 5%	½	02031180	BTS-820K-5%	Horiz. AFC Grid
R89	150KΩ 5%	½	02031000	BTS-150K-5%	Horiz. AFC Cathode
R90	8200Ω 5%	½	02030700	BTS-8200-5%	Horiz. AFC Filter Network
R91	100KΩ 5%	1	02033960	BTA-100K-5%	Horiz. Osc. Grid
R92	150KΩ 5%	1	02034000	BTA-150K-5%	Horiz. AFC Cathode
R93	8200Ω 5%	½	02030700	BTS-8200-5%	Horiz. Osc. Transformer Shunt
R94	68KΩ	½	02031990	BTS-68K	Voltage Divider
R95	120KΩ	½	02032020	BTS-120K	Voltage Divider
R96	150KΩ	½	02032030	BTS-150K	Horiz. AFC Filter Network
R97	47KΩ	1	02034970	BTA-47K	Horiz. Osc. Plate
R98	10KΩ	1	02034890	BTA-10K	Filter
R99	470KΩ	½	02032090	BTS-470K	Horiz. Output Grid
R100	47Ω	½	02031610	BW-½-47	Parasitic Suppressor
R101	100Ω	2	02037650	BW-2-100	Horiz. Output Cathode
R102	100Ω	½	02031650	BW-½-100	Parasitic Suppressor
R103	100Ω	2	02037650	BW-2-100	Horiz. Linearity Network
R104	10KΩ	2	02037890	BT-2-10K	Horiz. Size Coil Shunt
R105	5.6Ω	½	02100830		HV Rect. Filament-Wire Wound
R106	3900Ω	2	02037840	BT-2-3900	Horiz. Output Screen
R107	560KΩ	2	02038100		HV Filter
R108A	910Ω	5	02119910		Focus coil Shunt-Wire Wound
B	215Ω	5			Series Focus Coil-Wire Wound
R109A	1480Ω	5	02120300		Filter-Wire Wound
B	2140Ω	5			Filter-Wire Wound
R110	3300Ω 5%	2	02036600	BT-2-3300-5%	Filter
R111	3300Ω 5%	2	02036600	BT-2-3300-5%	Filter
R112	2400Ω 5%	2	02036570		Bleeder
R113	400Ω	10	†		Bias Network-Wire Wound-See Note 1
R114	27Ω 5%	1	†	BW-1-27-5%	Bias Network-See Note 2
R115	22Ω	1	02034570	BW-1-22	Series Dial Lamp
R116	1000Ω	½	02031770	BTS-1000	Decoupling
R117	15KΩ	½	02031910	BTS-15K	Voltage Divider-See Note 2
R118	2.2 Meg.	½	02032170	BTS-2.2 Meg.	Voltage Divider-See Note 2

† Items R113 and R114 in some models are combined into one resistor obtainable under Mfgr's Part No. 02120210.
Note 1. Some models use a 427Ω 10 watt resistor in this application.
Note 2. Not used in all models.
Note 13. Some models use a 5100Ω resistor in this application.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	DUMONT PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	4.5Ω	18003061 ②		10A4A	② Used in Guilford model only.
B	PM		18003041 ③			③ Used in Putnam model only.
	CONE DIA.	V. C. DIA.				
SP2A	9 1/2"	1"				
B						

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	DUMONT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC	720VCT	5VAC	6.3VAC	20004771			TP-360
	ⓐ 2.1A	.240ADC	ⓑ 3A	ⓒ 10A				

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA DUMONT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	160Ω	1330Ω	20004721	A-8121 ①	A-4000 ①	TBO-2	Vert. Block Osc. Trans
T3	390Ω	4Ω	20004781			TFB-3	Hor. Output Trans.
	Tap ④	SEC. 2					
	52Ω	0Ω					
T4	565Ω	6.4Ω	20004731	A-8112 ①	A-3038 ①	TSO-5 ①	Vert. Output Trans.
T5A	13Ω		21005501				Hor. Deflection Coil
B	65Ω						Vert. Deflection Coil
T6	820Ω		21005341		MF-2		Focus Coil

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA DUMONT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7A	5300Ω	4.5Ω	300Ω	.6Ω	Part of SP1A ②	A-3877①	A-3019	RO-9	① Drill one new mounting hole. ② Used in Guilford model only. ③ Used in Putnam model only.
B					Part of SP1B ③				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA DUMONT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.240ADC	10Ω	.190 Henries	21005431				① Drill one new mounting hole.
L2	.240ADC	57Ω	3.5 Henries	21005211	C-2326 ①	C-2991 ①	TR-3300①	

COILS (RF-IF)

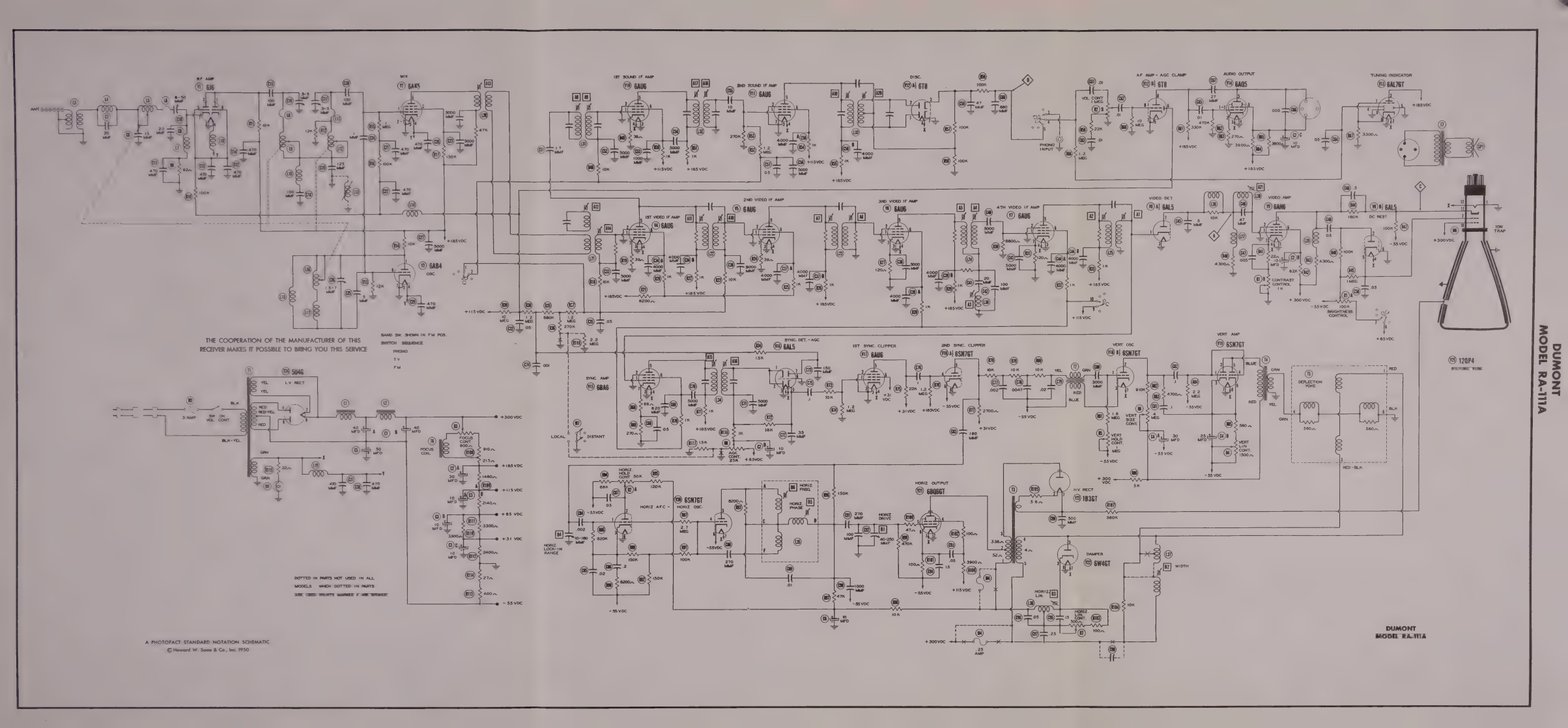
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA DUMONT PART No.	MEISSNER PART No.	NOTES
L3	Ant. Coil	0Ω	0Ω	20004592		
L4	Ant. Loading	0Ω		21005801		
L5	Ant. Coil	0Ω				Part of tuner, part #89003801.
L6	Ant. End Inductor	0Ω		21005721		
L7	RF Choke	0Ω		21005741		
L8	RF End Inductor	0Ω		21005722		
L9	RF Coil	0Ω				Part of tuner, part #89003801.
L10	Band Pass	0Ω		21005731		
L11	Mixer Grid End Inductor	0Ω		21005722		
L12	Mixer Grid	0Ω				Part of tuner, part #89003801.
L13	Band Pass	0Ω		21005521		Not used in all models.
L14	RF Choke	0Ω		21005421		
L15	Osc. Shunt	0Ω		21005131		
L16	Osc. Coil	0Ω				Part of tuner.
L17	Osc. End Inductor	0Ω		21005111		
L18	Fil. Choke	0Ω		21005421		
L19	Fil. Choke	0Ω		21005421		
L20	Conv. Trans.	.1Ω	.1Ω	20004951		
L21	1st Video IF	.1Ω	.5Ω	20004701		
L22	2nd Video IF	.7Ω	.7Ω	20004711		
L23	3rd Video IF	.8Ω	.7Ω	20004741		
L24	4th Video IF	.5Ω	.5Ω	20004751		
L25	5th Video IF	.8Ω	.5Ω	20004761		
L26	Peaking	12Ω		21004463		May be wound on 10KΩ resistor, part #21004652.
L27	Peaking	10Ω		21004467		Yellow dot
L28	Sound Trap	3Ω		21004831		Brown-Black dot
L29	Peaking	10Ω		21004467		Yellow dot
L30	Video IF Trap	.2Ω		21004802		Red-Orange dot
L31	1st Sound IF	.2Ω	.2Ω	20004511		
L32	2nd Sound IF	.2Ω	.2Ω	20004511		
L33	Disc. Trans.	.3Ω	.3Ω	20004441		
L34	Sync. Det. Trans.	.1Ω	.1Ω	20004671		
L35	Horiz. Osc. Trans.	75Ω	48Ω	20004611		Primary tapped at 22Ω
L36	Horiz. Lin.	7Ω		21005221		
L37	Horiz. Size	4.2Ω	2.5Ω	21005322		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA DUMONT PART No.		NOTES
M1	Bayonet	6-8	.15	Brown	12001310		Type #47

MISCELLANEOUS

ITEM No.	PART NAME	DUMONT PART No.	NOTES
M2	Tuner	89003301	
M3	Fuse	11000790	3A 250V Some models use 4A, part #11000800.
M4	Fuse	11001100	.25A 250V Type GJV
M5	Switch	05004001	Function Phono-TV-FM
M6	Ion Trap	21004852	
M7A	Switch	05003690	Local-Distant
B	Switch	05003050	Local-Distant
	Trimmer	03019370	2 section Horiz. freq. 10-160MMF, Horiz. drive 40-250MMF
	Safety Glass	45001852	Putnam only
	Safety Glass	45001851	Guilford only
	Knob	45001371	Main dial, mahogany
	Knob	45001431	Vernier dial, mahogany
	Knob	45001811	Focus, mahogany
	Knob	45001372	Main dial, blonde
	Knob	45001433	Vernier dial, blonde
	Knob	45001812	Focus, blonde


DUMONT
MODEL RA-111A
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DOTTED IN PARTS NOT USED IN ALL MODELS WHEN DOTTED IN PARTS
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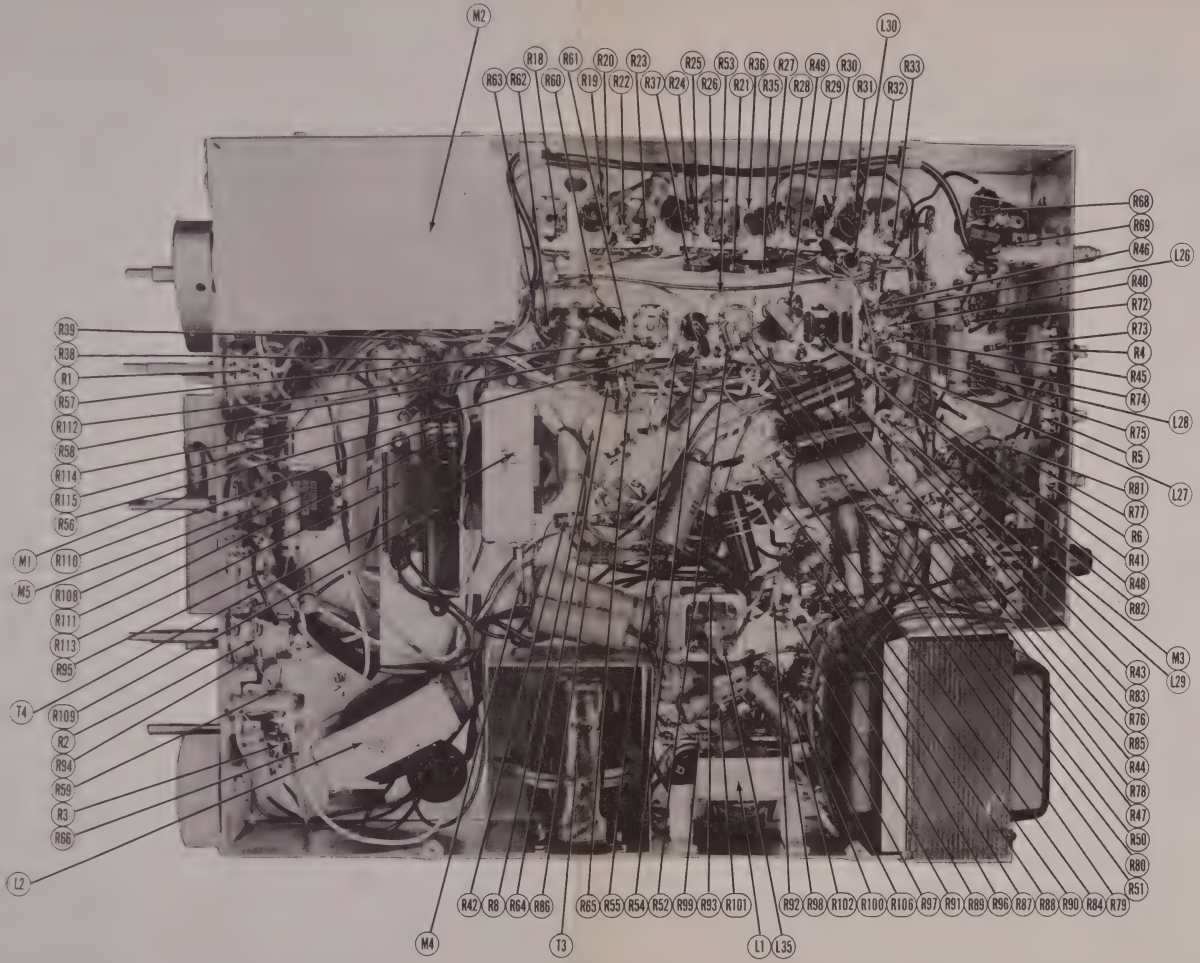
DUMONT
MODEL RA-111A



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

*TRADE MARK

EMERSON MODEL

649A (CH. 120094A)

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EMERSON MODEL
649A (CH. 120094A)

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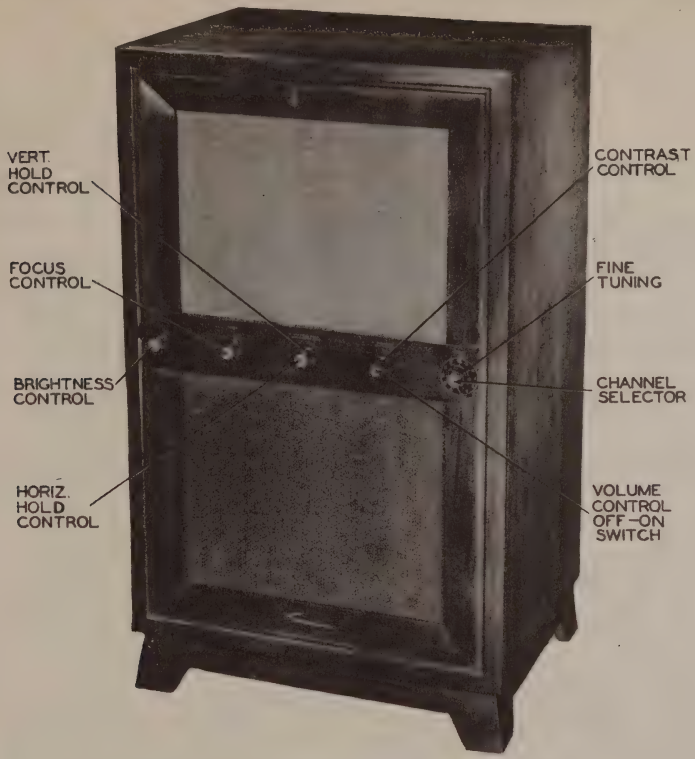
EMERSON MODEL 649A (Ch. 120094A)



EMERSON MODEL 649A (Ch. 120094A)

TRADE NAME	Emerson Model 649A (Ch. 120094A)
MANUFACTURER	Emerson Radio and Phonograph Corp., 111 Eighth Ave., New York 11, New York
TYPE SET	Projection Type Television Receiver
TUBES	Twenty Six
POWER SUPPLY	110-120 Volts AC
RATING	2.3 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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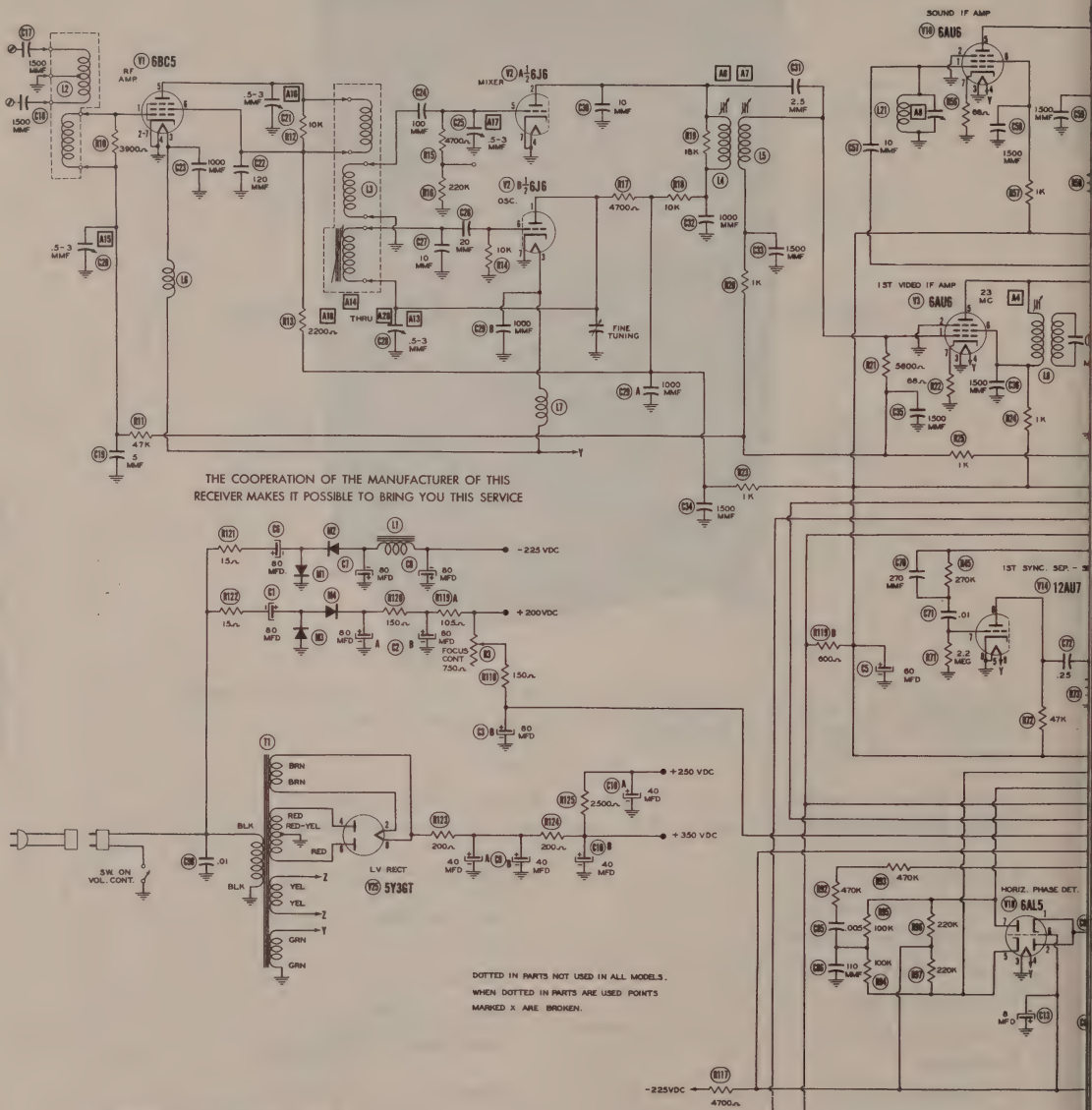
RF AMP
6BC5
MIXER
6J6
OSC
6J6
SOUND IF AMP
6AU6
1ST VIDEO IF AMP
6AU6
1ST SYNC. SEP. - 3
12AU7
HORIZ. PHASE DET.
6AL5
LV RECT.
5Y3GT
THRU
FINE TUNING
FOCUS CONT.
SW. ON VOL. CONT.
-225 VDC
+200VDC
+250 VDC
+350 VDC
-225VDC
THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DOTTED IN PARTS NOT USED IN ALL MODELS.
WHEN DOTTED IN PARTS ARE USED POINTS
MARKED X ARE BROKEN.
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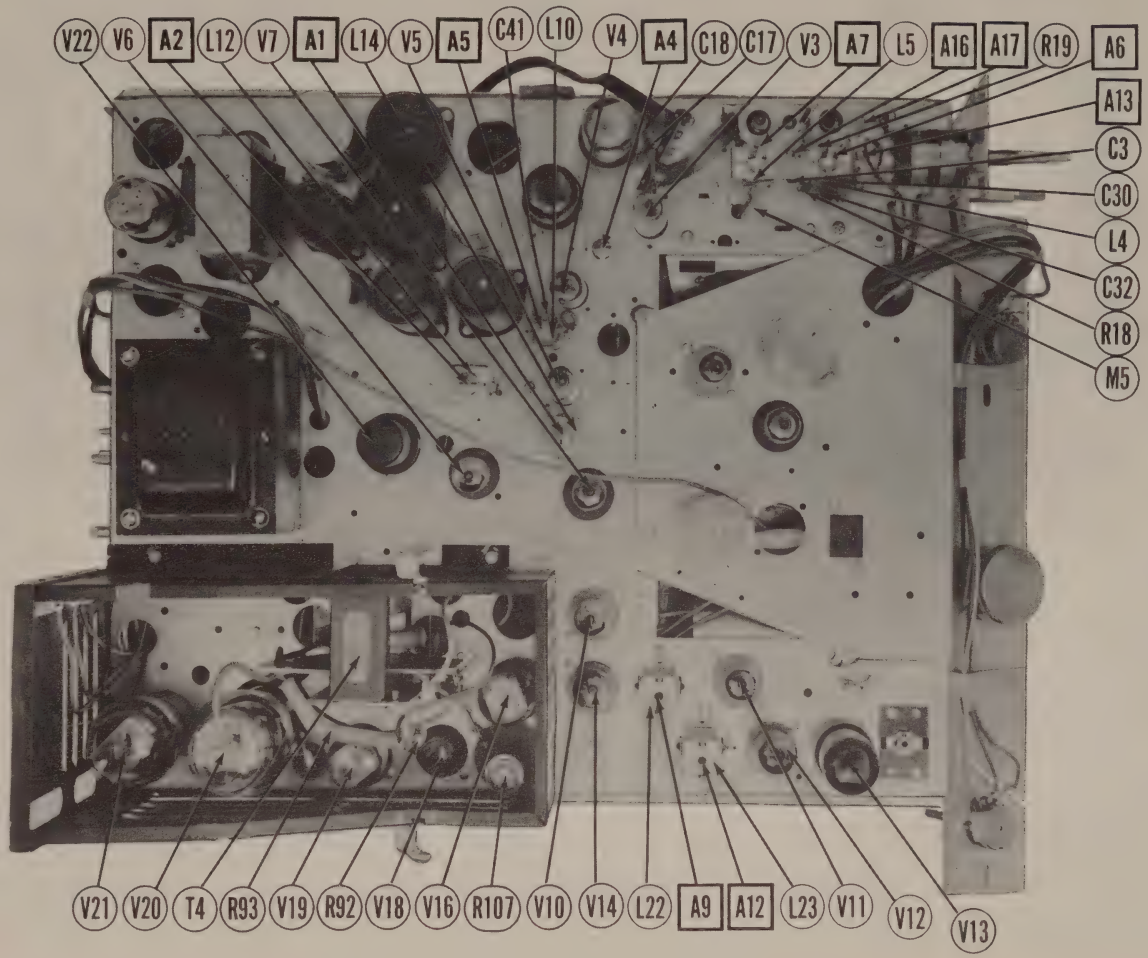
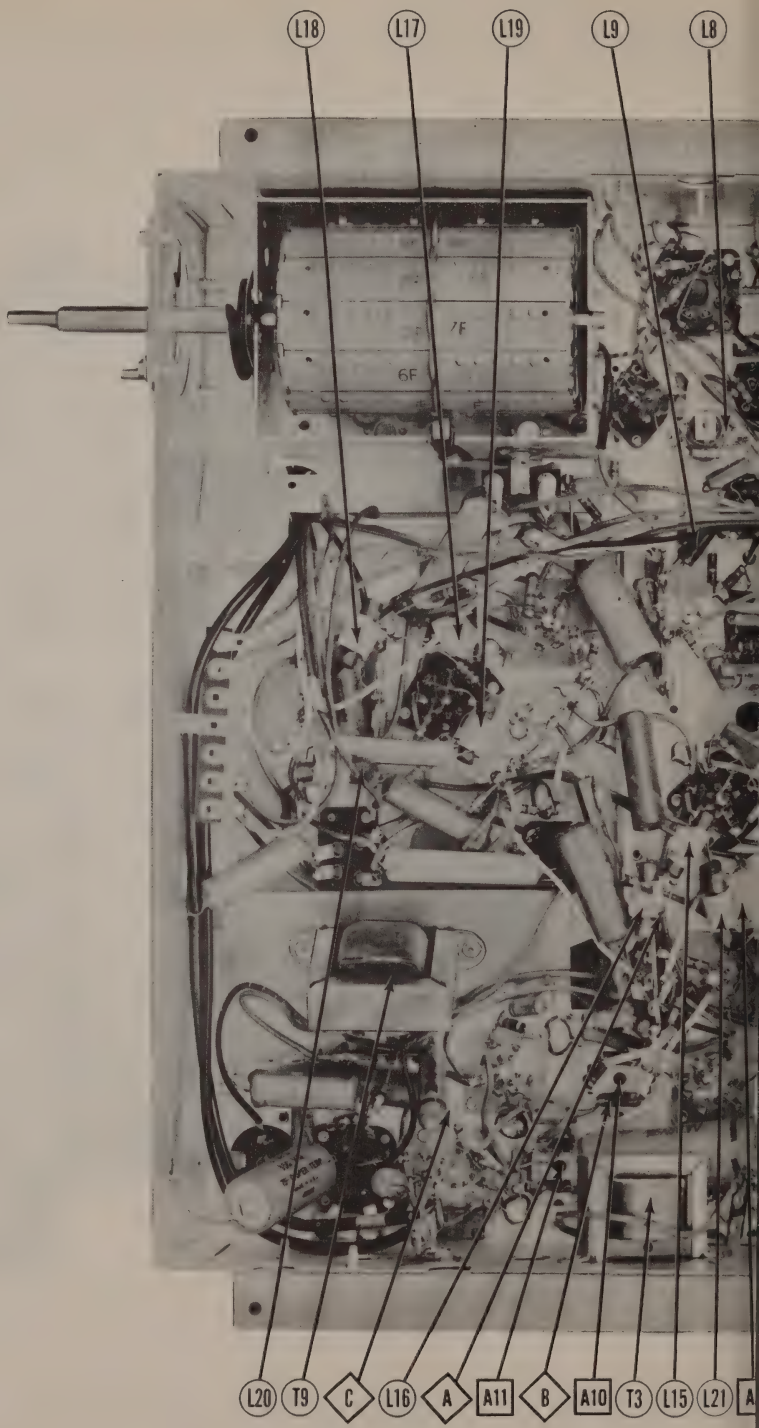


CHASSIS TOP VIEW



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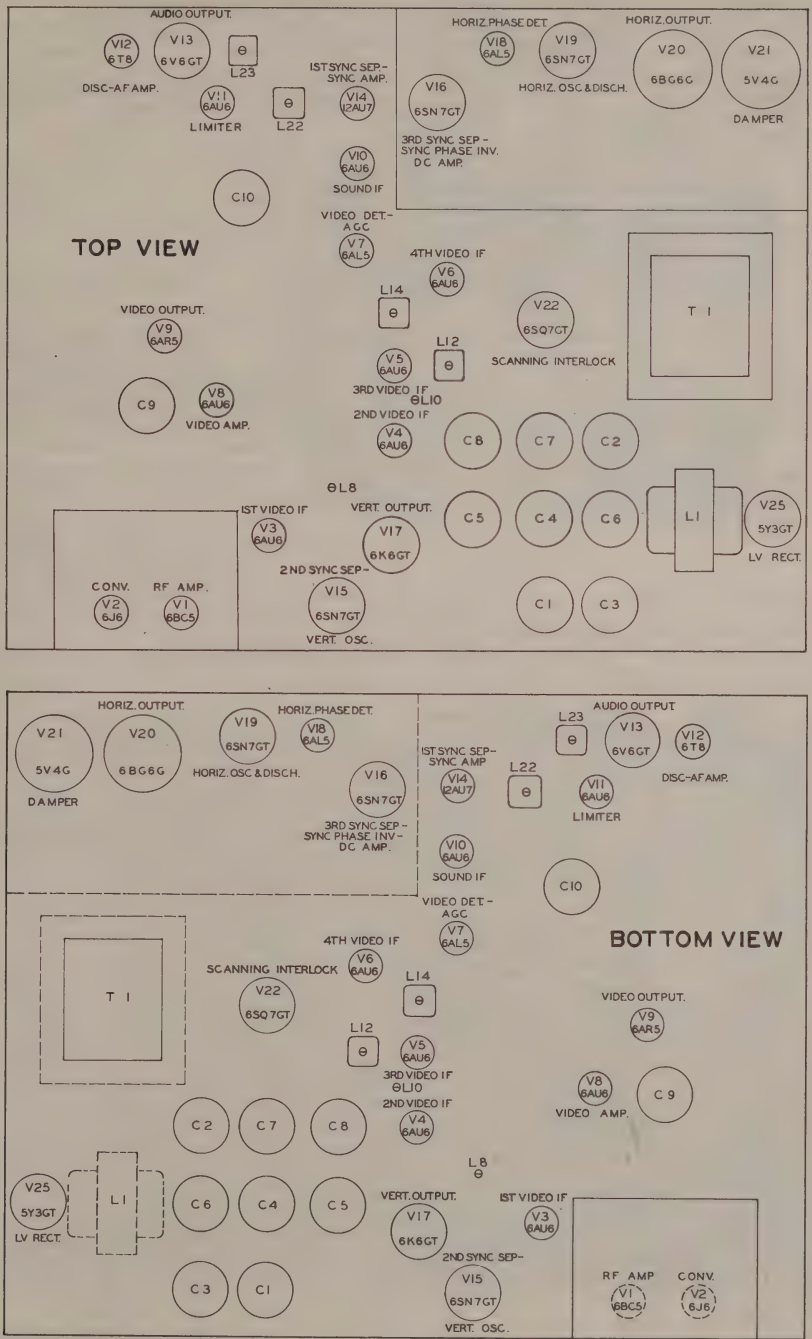


TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To remove the high voltage shock hazard remove the high voltage power supply plug from the main chassis.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 with pin 1 removed to prevent erroneous indications.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over "dummy" converter tube (V2). Low side to chassis.	Not used	25.75MC (Unmod.)	Any	Use VTVM. DC Probe to Point (A). Common to chassis.	A1	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum -1 volt readings.
2.	Direct	"	"	25MC (Unmod.)	"	"	A2	"
3.	Direct	"	"	22.3MC (Unmod.)	"	"	A3	"
4.	Direct	"	"	23MC (Unmod.)	"	"	A4	"
5.	Direct	"	"	21.25MC (Unmod.)	"	"	A5	Adjust for MINIMUM deflection.
6.	Direct	"	23MC (10MC SWP)	21.25MC 25.75MC	"	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A6, A7	Adjust to place markers on response curve similar to figure 1. The 25.75MC marker should be at 50% response. If necessary slightly retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	100KΩ res.	High side thru 100KΩ to pin 2 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (450KC Sweep)	4.5MC	Any	Vert. Amp. thru 100KΩ to Point (B). Low side to chassis.	A8, A9, A10	Adjust for maximum amplitude and symmetry as per figure 2.
8.	"	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A11, A12	Adjust A-11 to place 4.5MC at center of crossover lines as per figure 3. Adjust A12 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The overall oscillator circuit adjustment (A13) is pre-set at the factory and should not require adjustment in the field.
Adjustments A14 and A18 thru A28 are accessible through a hole in the front of the tuner as the channel switch is turned to the corresponding channel.
Set the fine tuning control to the mid-position of its range.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 150Ω carbon res.	Across antenna terminals with 150Ω in each lead.	207MC (10MC SWP)	209.75MC	12	Vert. Amp. thru 10KΩ resistor to Point (A). Low side to chassis.	A14	Adjust for response curve as per figure 1 with 21.25MC marker as shown.
10.	"	"	"	"	"	"	A15, A16, A17	Adjust for maximum amplitude and band width while maintaining best symmetry of overall response as per figure 1.
12.	"	"	213MC (10MC SWP)	215.75MC	13	"	A18	Adjust for response curve with marker as shown in figure 1.
			201MC (10MC SWP)	203.75MC	11		A19	
			195MC (10MC SWP)	197.75MC	10		A20	
			189MC (10MC SWP)	191.75MC	9		A21	
			183MC (10MC SWP)	185.75MC	8		A22	
			177MC (10MC SWP)	179.75MC	7		A23	
			85MC (10MC SWP)	87.75MC	6		A24	
			79MC (10MC SWP)	81.75MC	5		A25	
			69MC (10MC SWP)	71.75MC	4		A26	
			63MC (10MC SWP)	65.75MC	3		A27	
			57MC (10MC SWP)	59.75MC	2		A28	

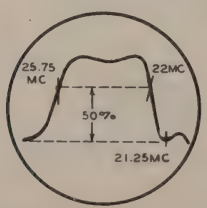


FIG. 1

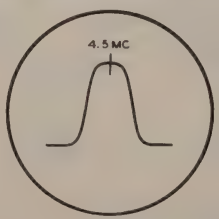


FIG. 2

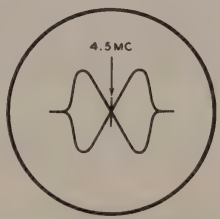
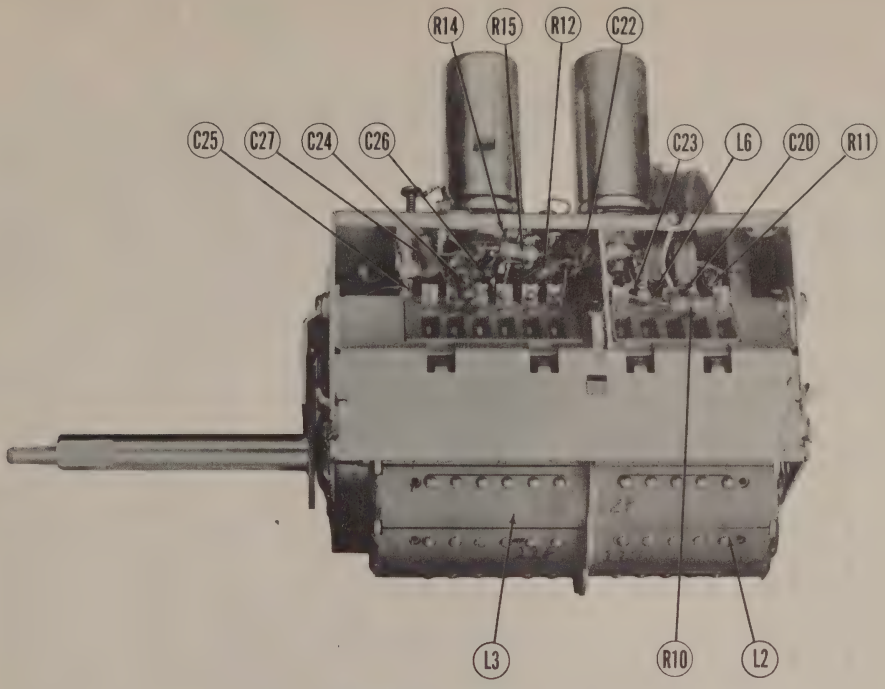
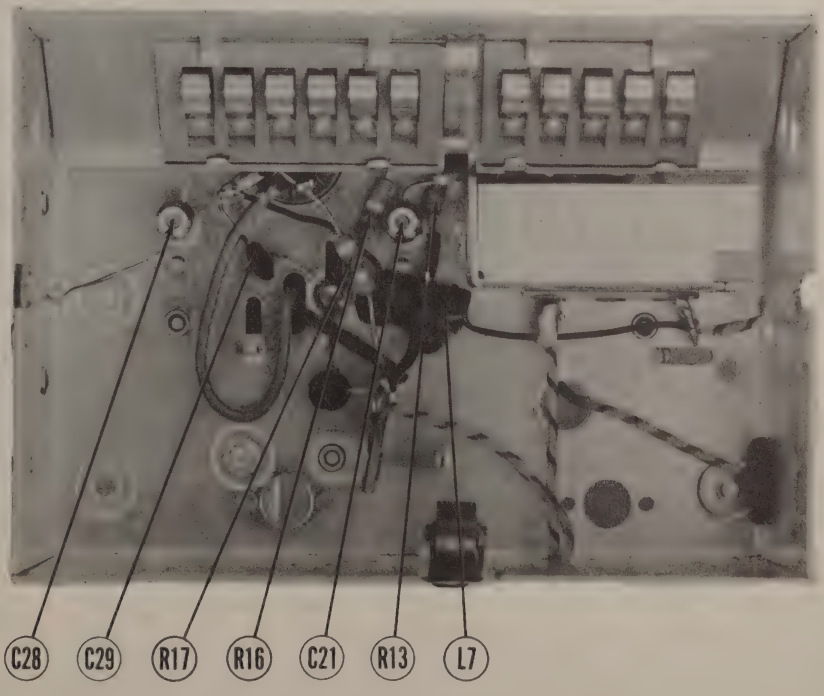


FIG. 3



RF TUNER- TOP VIEW



RF TUNER-BOTTOM VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	-.3VDC	0V.	6.3VAC	0V.	75VDC	75VDC	0V.		
V 2	6J6	50VDC	55VDC	6.3VAC	0V.	-.9VDC	§-1.2VDC	0V.		
V 3	6AU6	-1.4VDC	0V.	0V.	6.3VAC	90VDC	90VDC	.3VDC		
V 4	6AU6	-.2VDC	0V.	0V.	6.3VAC	90VDC	90VDC	.4VDC		
V 5	6AU6	0V.	0V.	0V.	6.3VAC	80VDC	90VDC	.7VDC		
V 6	6AU6	0V.	0V.	0V.	6.3VAC	90VDC	90VDC	1.2VDC		
V 7	6AL5	0V.	-.2VDC	0V.	6.3VAC	0V.	0V.	-.3VDC		
V 8	6AU6	.3VDC	0V.	0V.	6.3VAC	145VDC	165VDC	14VDC		
V 9	6AR5	#-1.2VDC	#0V.	0V.	6.3VAC	#170VDC	0V.	0V.		
V 10	6AU6	0V.	0V.	0V.	6.3VAC	90VDC	90VDC	.6VDC		
V 11	6AU6	-.4VDC	0V.	0V.	6.3VAC	90VDC	32VDC	0V.		
V 12	6T8	-.3VDC	-.3VDC	0V.	0V.	6.3VAC	0V.	0V.	-.3VDC	50VDC
V 13	6V6GT	0V.	0V.	250VDC	240VDC	-3.2VDC	-8VDC	6.3VAC	0V.	
V 14	12AU7	95VDC	0V.	7.4VDC	0V.	0V.	28VDC	-.2VDC	0V.	6.3VAC
V 15	6SN7GT	#-18VDC	#250VDC #100VDC	#0V.	0V.	6.6VDC	1VDC	6.3VAC	0V.	
V 16	6SN7GT	#38VDC	#32VDC	#44VDC	#12VDC	#190VDC	#50VDC	6.3VAC	0V.	
V 17	6K6GT	0V.	0V.	#240VDC	#240VDC	#0V.	#25VDC	6.3VAC	#4.3VDC #30VDC	
V 18	6AL5	#38VDC	#38VDC	0V.	6.3VAC	#40VDC	#44VDC	#37VDC		
V 19	6SN7GT	#2VDC	#225VDC	#45VDC	#2VDC	#100VDC	#45VDC	6.3VAC	0V.	
V 20	6BG6G	0V.	6.3VAC	#9VDC	#-2VDC	#-2.8VDC	#0V.	0V.	#220VDC	TOP CAP *
V 21	5V4G	0V.	¶6.3VAC	0V.	†-60VDC	0V.	†-60VDC	¶0V.	†16VDC	
V 22	6SQ7GT	0V.	#-3.7VDC	#0V.	#-40VDC	#-90VDC	0V.	6.3VAC	0V.	
V 23	6SR7	0V.	-50VDC	80VDC	-130VDC	-130VDC	350VDC	6.3VAC	0V.	
V 24	6BG6G	-105VDC	0V.	11VDC	11VDC	-105VDC	-135VDC	6.3VAC	340VDC	TOP CAP *
V 25	5Y3GT	0V.	430VDC	0V.	360VAC	0V.	360VAC	0V.	430VDC	
V 26	3NP4	0V.	6.3VAC	0V.	0V.	100VDC				

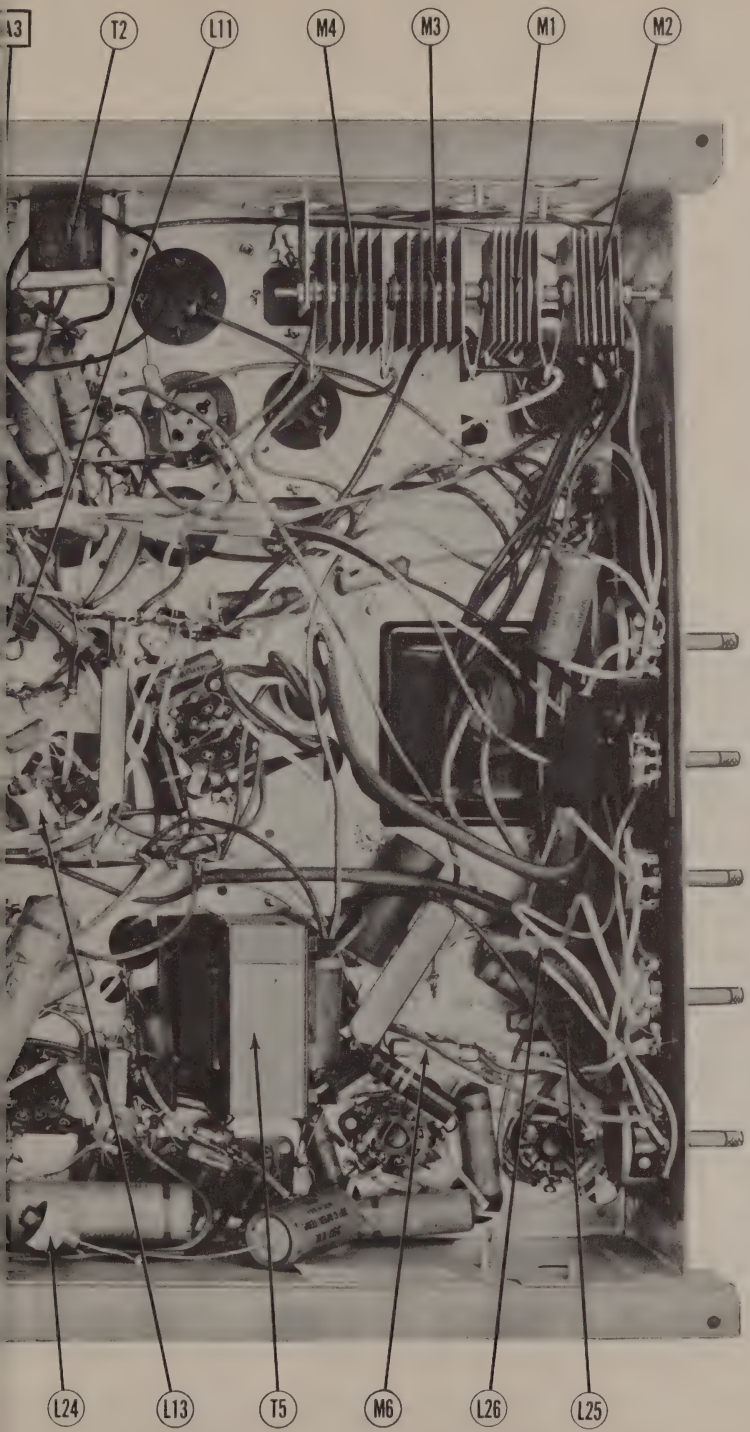
§ TAKEN WITH VACUUM TUBE VOLTMETER.
# MEASURED FROM JUNCTION OF C8 and L1.
¶ MEASURED FROM PIN 8 OF V21.
† MEASURED FROM JUNCTION OF M4, C2A, and R120.
* DO NOT MEASURE.

RESISTANCE READINGS

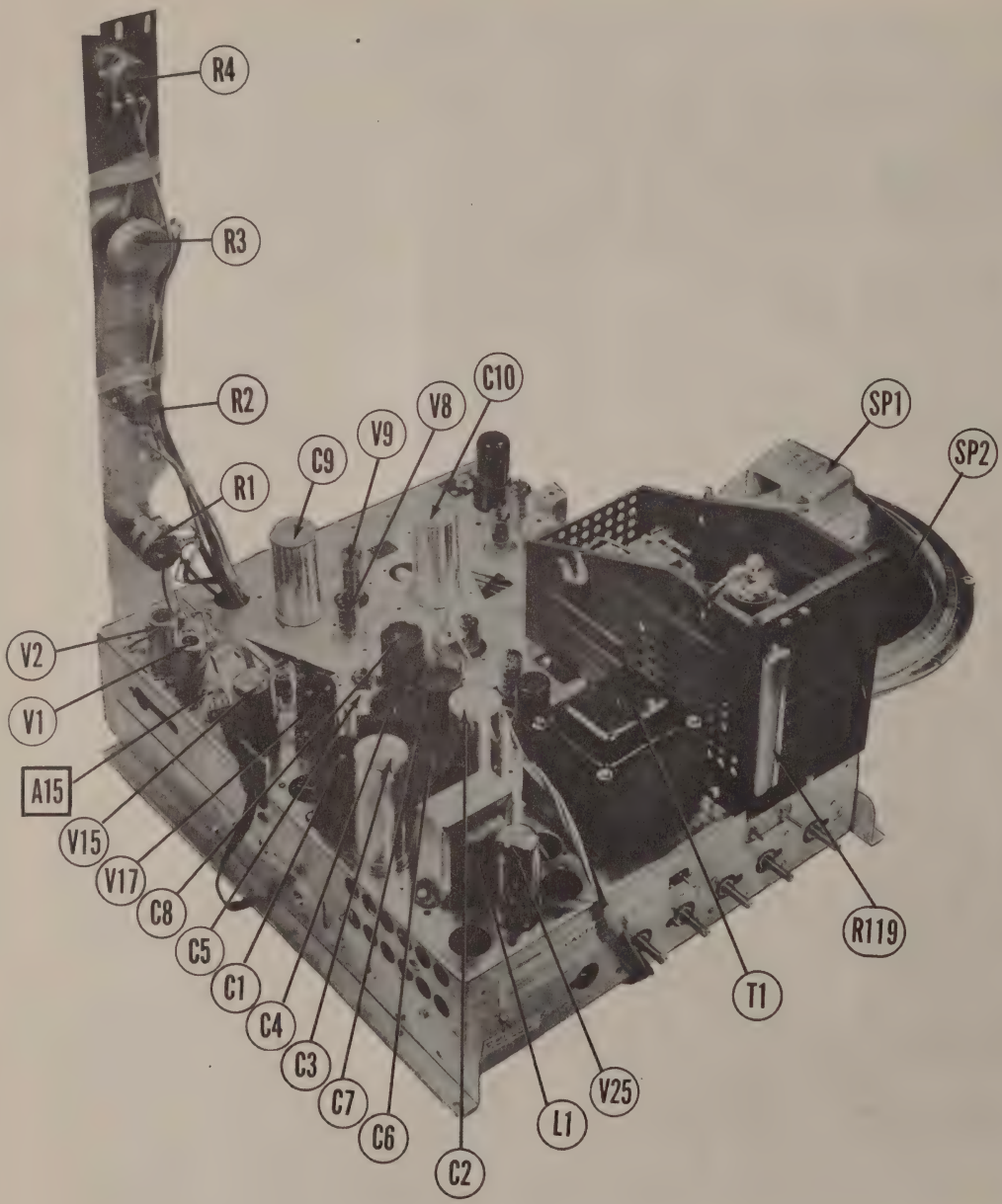
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	650KΩ	0Ω	.1Ω	0Ω	†4.2KΩ	†4.2KΩ	0Ω		
V 2	6J6	†6.7KΩ	†12KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AU6	600KΩ	0Ω	0Ω	.1Ω	†2KΩ	†2KΩ	68Ω		
V 4	6AU6	600KΩ	0Ω	0Ω	.1Ω	†2KΩ	†2KΩ	100Ω		
V 5	6AU6	3Ω	0Ω	0Ω	.1Ω	†6KΩ	†2KΩ	180Ω		
V 6	6AU6	.2Ω	0Ω	0Ω	.1Ω	†2KΩ	†2KΩ	180Ω		
V 7	6AL5	0Ω	4.7KΩ	0Ω	.1Ω	.3Ω	0Ω	33KΩ		
V 8	6AU6	1 Meg.	0Ω	0Ω	.1Ω	†3KΩ	†400Ω	1.5KΩ		
V 9	6AR5	#1.5 Meg.	#0Ω	0Ω	.1Ω	†4.3KΩ	0Ω	Inf.		
V 10	6AU6	4.9Ω	0Ω	0Ω	.1Ω	†2KΩ	†2KΩ	68Ω		
V 11	6AU6	100KΩ	0Ω	0Ω	.1Ω	†2KΩ	†10KΩ	0Ω		
V 12	6T8	100KΩ	100KΩ	200KΩ	0Ω	.1Ω	Inf.	0Ω	15 Meg.	♦485KΩ
V 13	6V6GT	0Ω	0Ω	♦3.2KΩ	♦13KΩ	585KΩ	120KΩ	.1Ω	0Ω	
V 14	12AU7	†48KΩ	0Ω	270KΩ	0Ω	0Ω	†48KΩ	2.2 Meg.	0Ω	.1Ω
V 15	6SN7GT	#1.5 Meg.	†470KΩ †2.5 Meg.	#0Ω	0Ω	†270KΩ	150KΩ	.1Ω	0Ω	
V 16	6SN7GT	Inf.	100KΩ	#5.7KΩ	#1 Meg.	7KΩ	#5.8KΩ	.1Ω	0Ω	
V 17	6K6GT	Inf.	0Ω	†11KΩ	†11KΩ	#4.7 Meg.	#12KΩ #6KΩ	.1Ω	#5.3KΩ #270Ω	
V 18	6AL5	Inf.	Inf.	0Ω	.1Ω	#200KΩ	#4.7KΩ	#200KΩ		
V 19	6SN7GT	150KΩ	9.2Ω	#4.7KΩ	150KΩ	†470KΩ	#4.7KΩ	.1Ω	0Ω	
V 20	6BG6G	Inf.	.1Ω	#100Ω	#940KΩ	#470KΩ	#0Ω	0Ω	†18KΩ	TOP CAP †8.3KΩ
V 21	5V4G	Inf.	¶.2Ω	Inf.	†500Ω	Inf.	†500Ω	¶0Ω	†8KΩ	
V 22	6SQ7GT	0Ω	#600KΩ	#0Ω	#850KΩ	#850KΩ	1 Meg.	.1Ω	0Ω	
V 23	6SR7	0Ω	♦390KΩ	♦180KΩ	270KΩ	270KΩ	♦600Ω	.1Ω	0Ω	
V 24	6BG6G	550KΩ	0Ω	390Ω	390Ω	550KΩ	250KΩ	.1Ω	♦730Ω	TOP CAP ♦725Ω
V 25	5Y3GT	Inf.	90KΩ	Inf.	65Ω	Inf.	65Ω	Inf.	90KΩ	
V 26	3NP4	1 Meg.	.1Ω	0Ω	0Ω	†220KΩ				

† MEASURED FROM JUNCTION OF M4, C2A, and R120.
# MEASURED FROM JUNCTION OF C8 and L1.
♦ MEASURED FROM PIN 8 OF V25.
¶ MEASURED FROM PIN 8 OF V21.

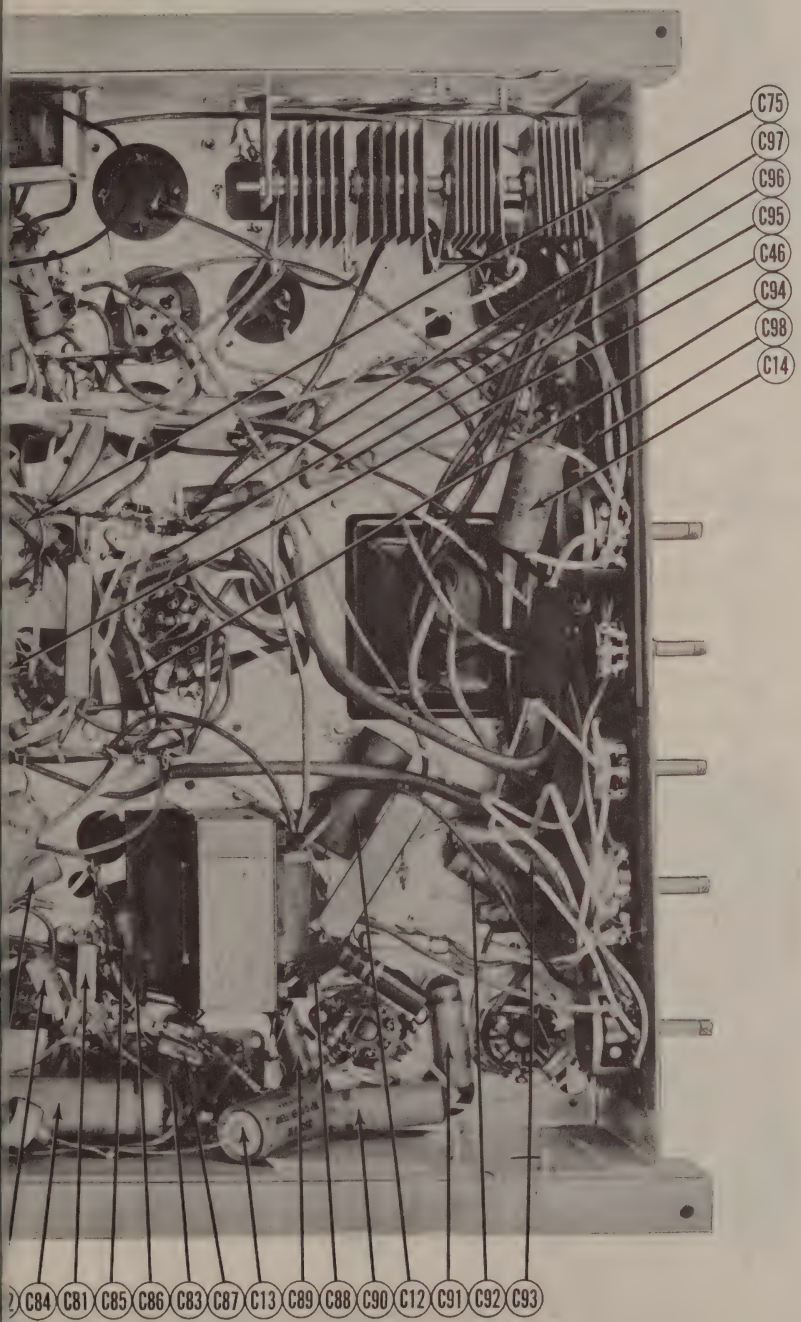
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



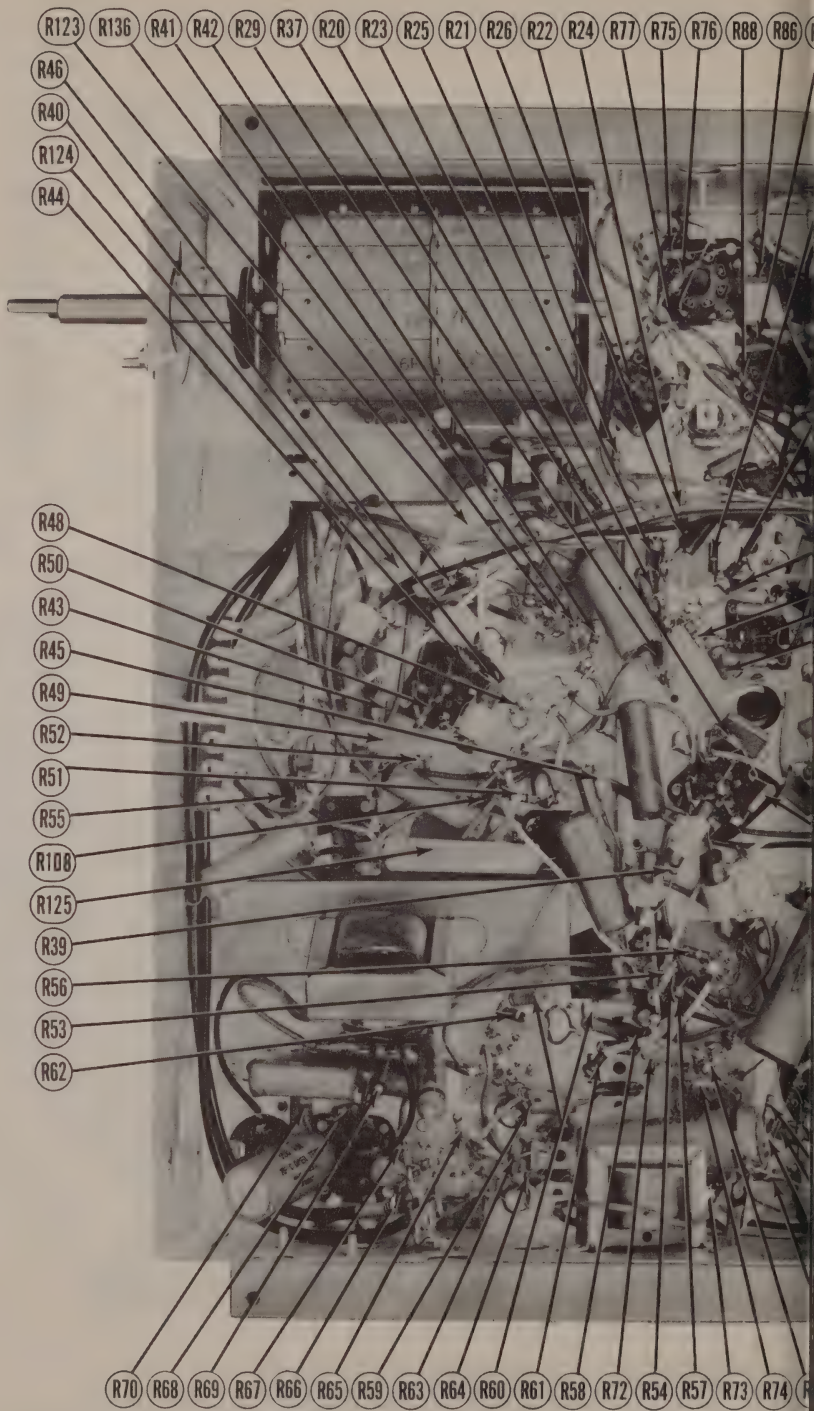
CTOR AND ALIGNMENT IDENTIFICATION



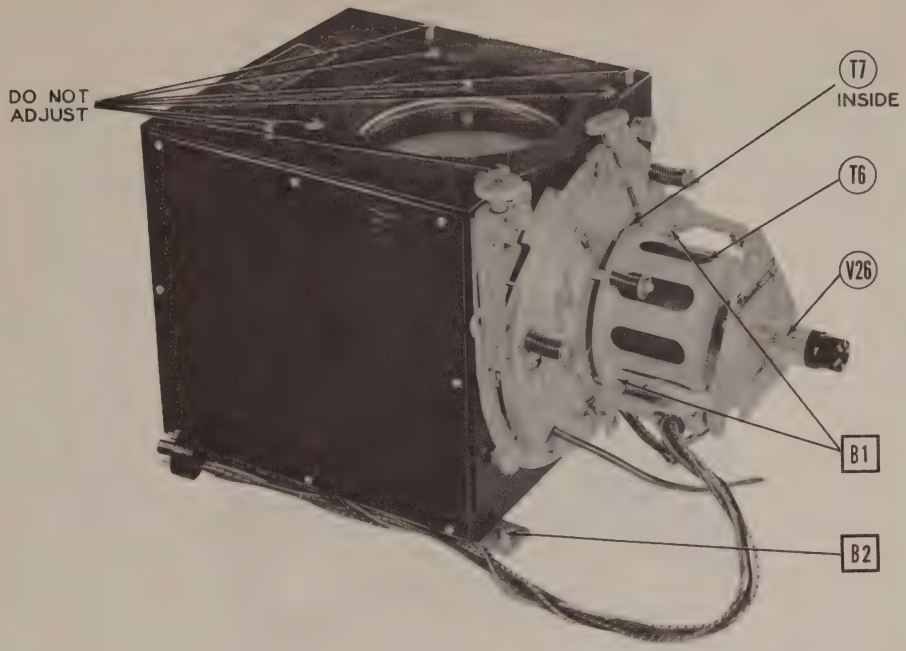
CHASSIS-TOP VIEW



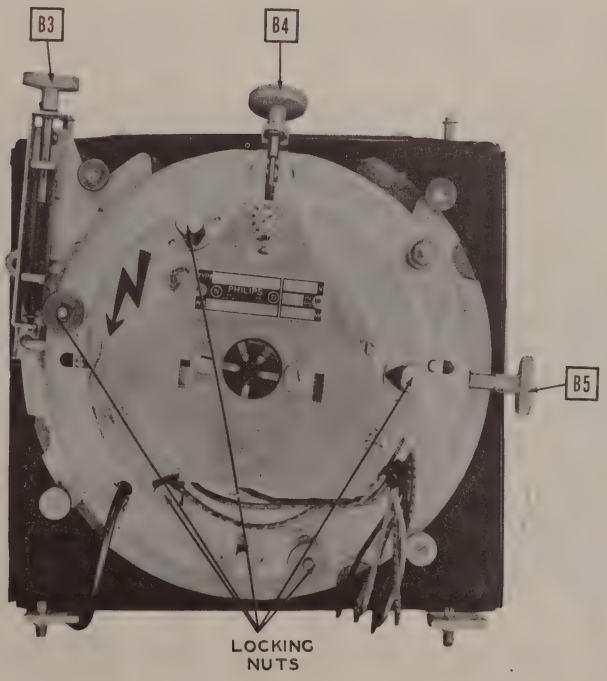
APACITOR IDENTIFICATION



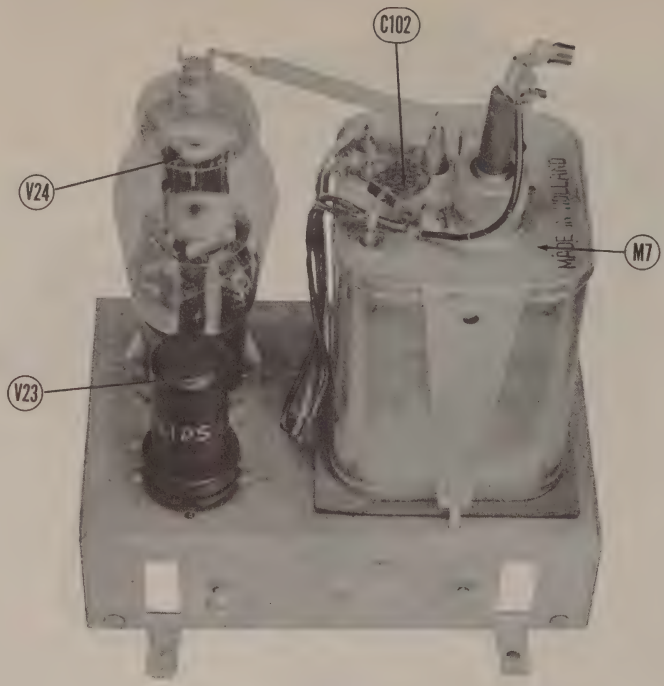
CHASSIS BOTTOM VIEW-



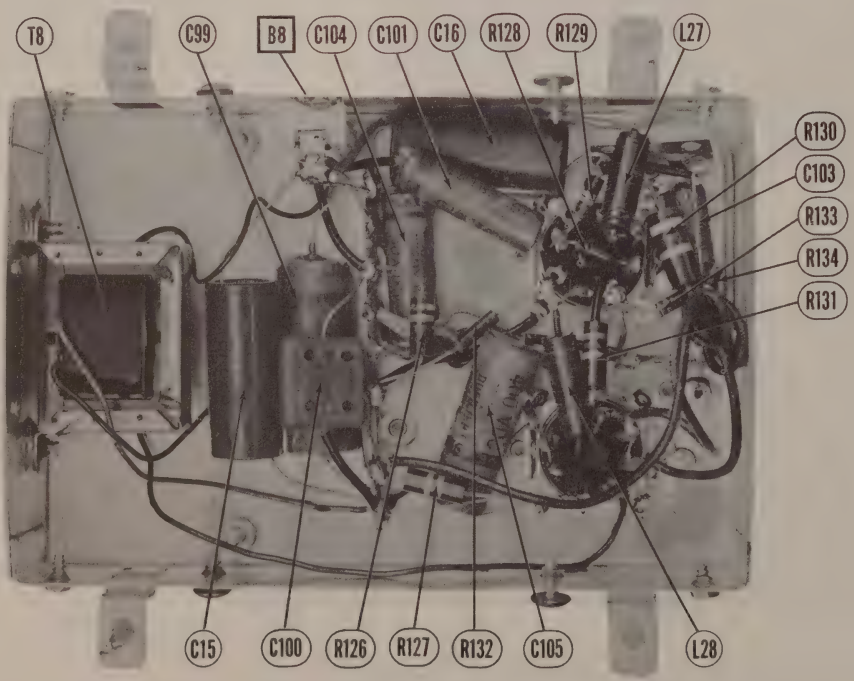
PROJECTION UNIT



DEFLECTION AND FOCUS COIL ASSEMBLY



HIGH VOLTAGE SUPPLY-TOP VIEW



HIGH VOLTAGE SUPPLY-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.		6BC5	7BD	Alternate 6AG5 #800535
V2	Converter	800536	6J6	7BF	
V3	1st Video IF	800533	6AU6	7BK	
V4	2nd Video IF	800533	6AU6	7BK	
V5	3rd Video IF	800533	6AU6	7BK	
V6	4th Video IF	800533	6AU6	7BK	
V7	Video Det. -AGC	800541	6AL5	6BT	
V8	Video Amp.	800533	6AU6	7BK	
V9	Video Output	800038	6AR5	7CC	
V10	Sound IF Amp.	800533	6AU6	7BK	
V11	Limiter	800533	6AU6	7BK	
V12	Disc. -AF Amp.	800035	6T8	8BD	
V13	Audio Output	800270	6V6GT	7AC	
V14	1st Sync. Sep. - Sync. Amp.	800026	12AU7	9A	
V15	2nd Sync. Sep. - Sync. Osc.	800380	6SN7GT	8BD	
V16	3rd Sync. Sep. - Sync. Phase Inv. - Hor. DC Amp.	800380	6SN7GT	8BD	
V17	Vert. Output	800016	6K6GT	7S	
V18	Hor. Phase Det.	800541	6AL5	6BT	
V19	Hor. Osc. -Disch.	800380	6SN7GT	8BD	
V20	Hor. Output	800004	6BG6G	5BT	
V21	Hor. Damping	800011	5V4G	5L	
V22	Scanning Int.	800430	6SQ7GT	8Q	
V23	HV Osc.	800033	6SR7	8Q	
V24	HV Output	800004	6BG6G	5BT	
V25	LV Rect.	800180	5Y3GT	5T	
V26	Picture Tube	810004	3NP4	5VB	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	80	150	925128	E4A37		UP7AJ474		TVL-1421	Voltage Doubler
C2A	80	300	925129	E4B139		UP8830		TVL-2585	▲ Filter
B	80	300							■ Filter
C3A	80	300	925131	AFH616G		UP8830		TVL-2585	▲ Filter
B	80	300							■ Filter
C4A	1000	15	925097	AF200200P		UP11M-15		TVL-2160	▲ Vert. Cent. Cont. Byp.
B	1000	15							■ Hor. Cent. Cont. Byp.
C5	60	300	925134	AFH6G6H		UP3335		TVL-1570	Filter
C6	80	150	925099	E3A72		UPE8015		TVL-1420	Voltage Doubler
C7	80	300	925132	AFH16G		UP8030		TVL-1573	Filter
C8	80	300	925133	AFH16G		UP8030		TVL-62	Filter
C9A	40	450	925127	AFH88J		UP4445		TVL-2764	▲ Filter
B	40	450							▲ Filter
C10A	40	450	925127	AFH88J		UP4445		TVL-2764	▲ Filter
B	40	450							▲ Filter
C11	8	350	925114	PRS350/8		BR835A		TVA-1603	Decoupling
C12	8	350	925114	PRS350/8		BR835A		TVA-1603	Vert. Output Dec.
C13	8	350	925114	PRS350/8		BR835A		TVA-1603	Decoupling
C14	10	50	925072	PRS50/10		BR105		TVA-1304	Vert. Output Cath.
C15	8	250		PRS250/8		BR835A		TVA-1503	HV Osc. Cath.
C16	20	50		PRS50/20		BR205A		TVA-1306	HV Output Cath.
C17	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	Ant. Coupling
C18	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	Ant. Coupling
C19	5			SI5DNPO	D2-4.7		NPOK-5		Fixed Trimmer *
C20	.5-3				829-3				Variable Trimmer
C21	.5-3				829-3				Variable Trimmer
C22	120			GP120K	D6-121		GP2K-120		RF Decoupling
C23	1000			GP1000M	D6-102		811-001	29C4	RF Filament
C24	100			SI100KN750	DN-100		N750L-100		RF Coupling
C25	.5-3				829-3				Variable Trimmer
C26	20			SI20JNPO	D2-20		NPOK-20		Osc. Grid Cap.
C27	10			SI10DN750	DN-10		N750K-10		Fixed Trimmer
C28	.5-3				829-3				Variable Trimmer
C29A	1000			GP1000M	D6-102				RF Bypass
B	1000			GP1000M	D6-102		882-2 x 0015	29C7	Conv. Filament
C30	10	500		1469-00001	D2-10		NPOK-10		Fixed Trimmer
C31	2.5								IF Coupling
C32	1000			GP1000M	D6-102		811-001	29C4	Conv. Plate Dec.
C33	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	AGC Filter
C34	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	RF Bypass
C35	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	AGC Filter
C36	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	1st V. IF Dec.
C37	75			CN75KNPO	D2-75				Fixed Trimmer
C38	270	500	910015	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C39	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	AGC Filter
C40	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	2nd V. IF Dec.
C41	75			CN75KNPO	D2-75				Fixed Trimmer
C42	270	500	910015	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C43	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	3rd V. IF Dec.
C44	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	3rd V. IF Cath.
C45	270	500	910015	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C46	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	4th V. IF Dec.
C47	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	4th V. IF Cath.
C48	270	500	910015	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C49	100	500	910100	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	IF Coupling
C50	.25	200	923080	P488-25		GT2P25		TC-2	AGC Filter
C51	.05	400	923062	P488-05		PTE4S5		TM-15	Video Coupling
C52	.05	600	923073	P688-05		PTE6S5		TM-15	Video Coupling
C53	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	RF Bypass *

CAPACITORS (CONT.)

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C54	.1	400	923064	P488-1		PTE4P1		TM-1	Bias Filter
C55	.05	400	923062	P488-05		PTE4S5		TM-15	Video Coupling
C56	.05	400	923062	P488-05		PTE4S5		TM-15	Pic. Tube Cath. Byp.
C57	10	500	900130	1468-00001	D6-100	5W5Q1	GP1K-10	MS-41	S. IF Coupling
C58	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	1st S. IF Screen
C59	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	1st S. IF Plate
C60	68	500	910031	1468-000075	D6-680	5W5Q7	GP1K-68	1FM-475	Limiter Grid Filter
C61	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	Limiter Screen Byp.
C62	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	Limiter Plate Dec.
C63	110	500	910010	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	RF Bypass
C64	.002	600	923071	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	De-emphasis
C65	.01	400	923061	P488-01	D6-103	PTE4S1	811-01	TM-11	Audio Coupling
C66	.01	400	923061	P488-01	D6-103	PTE4S1	811-01	TM-11	Audio Coupling
C67	.05	400	923062	P488-01		PTE4S5		TM-15	Audio Coupling
C68	.1	200	923067	P288-1		PTE4P1		TM-1	Bias Filter
C69	.005	400	923078	P688-005	D6-502	PTE6D5	811-005	TM-25	Output Plate Byp.
C70	270	500	910015	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	Sync. Coupling
C71	.01	400	923061	P488-01	D6-103	PTE4S1	811-01	TM-11	Sync. Coupling
C72	.25	600	923066	684-25		GT6P25		TC-2	Sync. Coupling
C73	.25	600	923066	684-25		GT6P25		TC-2	Sync. Coupling
C74	.05	400	923062	P488-05		PTE4S5		TM-15	Sync. Coupling
C75	.01	1000	923075	P1088-01		PTE16S1		MB-11	Vert. Sync. Coupling
C76	.005	400	923078	P688-005	D6-502	PTE6D5	811-005	TM-25	Integrator Net.
C77	.005	400	923078	P688-005	D6-502	PTE6D5	811-005	TM-25	Integrator Net.
C78	.004	600	923094	P688-004		PTE6D4	GP2M-004	TM-24	Vert. Osc. Grid
C79	.05	600	923073	P688-05		PTE6S5		TM-15	Vert. Discharge
C80	.05	600	923073	P688-05		PTE6S5		TM-15	Vert. Sweep Coupling
C81	1000	500	910027	1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C82	1000	500	910027	1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C83	.05	400	923062	P488-05		PTE4S5		TM-15	AFC Filter
C84	.25	600	923066	684-25		GT6P25		TC-2	Hor. AFC Feedback
C85	.005	600	923077	P688-005	D6-502	PTE6D5	811-005	TM-25	Hor. Feedback
C86	110	500	910010	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Voltage Divider
C87	800	500	910023	1468-00075	D6-751	1W5T8	GP2K-750	MS-38	Hor. Osc. Grid Cap.
C88	820	500				1W5T8		MS-38	Hor. Discharge †
C89	.001	600	923079	P688-001	D6-102	PTE6D1	GP2L-001	TM-21	Hor. Sweep Coupling
C90	.05	600	923073	P688-05		PTE6S5		TM-15	Hor. Output Screen
C91	.1	200	923067	P288-1		PTE4P1		TM-1	Hor. Output Cath.
C92	.035	600	923074	P688-033					Damper Filter
C93	.05	600	923073	P688-05		PTE6S5		TM-15	Damper Filter
C94	.01	1000	923075	P1088-01		PTE16S1		MB-11	Vert. Sweep Coupling
C95	.001	600	923079	P688-001	D6-102	PTE6D1	GP2L-001	TM-21	Hor. Sweep Coupling
C96	.001	600	923071	P688-001	D6-102	PTE6D1	GP2L-001	TM-21	Scan. Interlock Filter
C97	.01	400	923061	P488-01	D6-103	PTE4S1	811-01	TM-11	Scan. Interlock Filter
C98	.01	400	922015	P488-01	D6-103	PTE4S1	811-01	TM-11	Line Filter
C99	.1	600		P688-1		PTE6P1		TM-1	RF Bypass
C100	2700	500			D6-272		GP2M-0027		HV Osc. Grid
C101	.01	600		P688-01	D6-103	PTE6S1	811-01	TM-11	HV Osc. Coupling
C102	100	500		1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	RF Bypass
C103	.03	400		P488-03		PTE6S3		TM-13	Bias Filter
C104	.015	400		P488-015		PTE6S15		TM-12	Bias Filter
C105	.1	400		P488-1		PTE4P1		TM-1	RF Bypass *

* Not used in all models.
† Some models use 470MMF in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	2500Ω	2	390074-1		RTV-66	SBB-646-S	Contrast control-Wire Wound-front
B	1 Meg.	½					Volume control and switch-rear
R2A	1 Meg.	½		Concentrikit			
B	50KΩ	½	390074-3	Bll-137 *	RTV-65	SBB-645	Vert. hold control-front
C	Shaft End			Bll-123 *			Horiz. hold control-rear
				E-187 *			Attach per instr. in "Concentrikit".
R3	750Ω	3	390074-4		58-750	V-128	Focus control-Wire Wound
R4A	100KΩ	½	390074-2	Qll-128	AM-49-S	B-40	Brightness control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R4A per instructions
R5	5000Ω	½	390039	W-5000	43-5000	V-135	Vert. linearity control-Wire Wound
R6A	2 Meg.	½	390038	Qll-139	AG-83-S	AN-75	Vert. size control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R6A per instructions
R7A	20KΩ	½	390035	Qll-119	AG-36-S	AN-22	Horiz. drive control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R7A per instructions
R8	30Ω	2	390054	W-30	43-30	V-112	Horiz. centering control-Wire Wound
R9	30Ω	2	390033	W-30 x 15	RTV-67	SVT-902	Vert. centering control, tapped at 15Ω Wire Wound

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	EMERSON PART No.	IRC PART No.	ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R10	3900Ω	½	340632	BTS-3900	RF Amp. Grid
R11	47KΩ 20%	½			AGC Network
R12	10KΩ	½	340732		RF Amp. Plate Coil Shunt
R13	2200Ω 20%	½		BTS-2200	RF Amp. Decoupling
R14	10KΩ	½	340732		Osc. Grid
R15	4700Ω	½	340652	BTS-4700	Conv. Grid
R16	220KΩ 20%	½			Conv. Grid
R17	4700Ω	½	340652	BTS-4700	Osc. Plate
R18	10KΩ	½	340732		Conv. Plate Decoupling-See Note 1
R19	18KΩ				Conv. Plate Coil Shunt
R20	1000Ω	½	340492	BTS-1000	AGC Network
R21	56000Ω 5%	½	330672		1st Video IF Amp. Grid
R22	68Ω	½	340212		1st Video IF Amp. Cathode

RESIST

ITEM No.	RATING		REPLACEMENT DAT	
	RESISTANCE	WATTS	EMERSON PART No.	I PART
R23	1000Ω	½	340492	BTS-1
R24	1000Ω	½	340492	BTS-1
R25	1000Ω	½	340492	BTS-1
R26	3900Ω 5%	½	330632	BTS-3
R27	100Ω 20%	½	340252	
R28	1000Ω	½	340492	BTS-1
R29	1000Ω	½	340492	BTS-1
R30	6800Ω 5%	½	330692	
R31	180Ω	½	340312	
R32	3900Ω 5%	1	360632	BTA-3
R33	1000Ω	½	340492	BTS-1
R34	180Ω	½	340312	
R35	10KΩ 5%	½	330732	
R36	1000Ω	½	340492	BTS-1
R37	560KΩ	½	341152	
R38	33KΩ	½	340852	BTS-3
R39	4700Ω 5%	½	330652	BTS-4
R40	2.2 Meg.	½	341292	BTS-2
R41	15KΩ	½	340772	BTS-1
R42	1 Meg.	½	341212	BTS-1
R43	2700Ω 5%	½	330592	BTS-2
R44	2200Ω	½	340572	BTS-2
R45	270KΩ	½	341072	BTS-2
R46	15KΩ	½	340772	BTS-1
R47	470KΩ	½	341132	BTS-4
R48	470KΩ	½	341132	BTS-4
R49	3300Ω	4	394097	
R50	15KΩ	½	340772	BTS-1
R51	1 Meg.	½	341212	BTS-1
R52	220KΩ	½	341052	BTS-2
R53	270KΩ	½	341072	BTS-2
R54	15KΩ	½	340772	BTS-1
R55	220KΩ	½	341052	BTS-
R56	68Ω	½	340212	
R57	1000Ω	½	340492	BTS-
R58	1000Ω	½	340492	BTS-
R59	100KΩ	½	340972	
R60	10KΩ	1	370732	BTA-
R61	1000Ω	½	340492	BTS-
R62	4700Ω	½	340652	BTS-
R63	100KΩ	½	340972	BTS-
R64	100KΩ	½	340972	BTS-
R65	68KΩ	½	340932	BTS-
R66	15 Meg.	½	351492	BTS-
R67	470KΩ	½	341132	BTS-
R68	470KΩ	½	341132	BTS-
R69	100KΩ	½	340972	BTS-
R70	10KΩ	½	340732	BTS-
R71	2.2 Meg.	½	341292	BTS-
R72	47KΩ	½	340892	BTS-
R73	270KΩ	½	341072	BTS-
R74	47KΩ	½	340892	BTS-
R75	150KΩ	½	341012	BTS-
R76	270KΩ	½	341072	BTS-
R77	22KΩ	½	340812	BTS-
R78	1 Meg.	½	341212	BTS-
R79	1000Ω 5%	½	330492	BTS-
R80	150Ω	½	340292	BW-
R81	4700Ω 5%	½	330652	BTS-
R82	2200Ω 5%	½	330572	BTS-
R83	22KΩ	½	340812	BTS-
R84	22KΩ	½	340812	BTS-
R85	4700Ω	½	340652	BTS-
R86	1.5 Meg. 5%	½	331252	BTS-
R87	470KΩ	½	341132	BTS-
R88	6800Ω	½	340692	BTS-
R89	4.7 Meg.	½	341372	BTS-
R90	270Ω	½	340352	BW-
R91	10KΩ	3	397043	
R92	470KΩ	2	371132	BT-2
R93	470KΩ	2	371132	BT-2
R94	100KΩ 5%	½	330972	BTS-
R95	100KΩ 5%	½	330972	BTS-
R96	220KΩ	½	341052	BTS-
R97	220KΩ	½	341052	BTS-
R98	47KΩ	½	340892	BTS-
R99	1000Ω 5%	½	330492	BTS-
R100	100KΩ 5%	1	360972	BTA-
R101	47KΩ	½	340892	BTS-
R102	470KΩ	½	341172	BTS-
R103	4700Ω	½	340652	BTS-
R104	470KΩ	½	341172	BTS-
R105	100Ω	2	397027	BW-
R106	18KΩ	2	397070	BT-2
R107	7500Ω 5%	25	394007	
R108	22KΩ	½	340812	BTS-
R109	3.3 Meg.	½	341332	BTS-
R110	1 Meg.	½	341212	BTS-
R111	1 Meg.	½	341212	BTS-
R112	3.3 Meg.	½	341332	BTS-
R113	68KΩ	½	340932	BTS-
R114	100KΩ	½	340972	BTS-
R115	1 Meg.	½	341212	BTS-
R116	3.3 Meg.	½	341332	BTS-
R117	4700Ω	½	340652	BTS-
R118	150Ω	3	394060-9	
R119A	105Ω	5	394052	
B	600Ω	6		
R120	150Ω 20%	10	394060-7	AB-
R121	15Ω	½	394103	
R122	15Ω	½	394103	
R123	200Ω	5	394092	
R124	200Ω	5	394092	AB-
R125	2500Ω	10	394044	AB-

IPTIONS (Continued)

(CONT.)

IDENTIFICATION CODES
Decoupling
1st Video IF Amp. Decoupling
AGC Network
2nd Video IF Amp. Grid
2nd Video IF Amp. Cathode-See Note 2
2nd Video IF Amp. Decoupling
AGC Network
3rd Video IF Amp. Grid
3rd Video IF Amp. Cathode
3rd Video IF Amp. Plate
3rd Video IF Amp. Decoupling
4th Video IF Amp. Cathode
Peaking Coil Shunt
4th Video IF Amp. Decoupling
AGC Network
AGC Rect. Diode Load
Video Det. Diode Load
Voltage Divider
Voltage Divider
Video Amp. Grid
Video Amp. Plate
Isolation
Isolation
Peaking Coil Shunt
Voltage Divider
Video Output Grid
Video Output Plate-Wire Wound
Peaking Coil Shunt
Picture Tube Grid
Voltage Divider
Bias Network
Bias Network
Voltage Divider
Sound IF Amp. Cathode
Sound IF Amp. Screen
Sound IF Amp. Plate Decoupling
Limiter Grid
Limiter Screen-See Note 3
Limiter Plate Decoupling
Voltage Divider
Disc. Diode Load
Disc. Diode Load
De-emphasis
AF Amp. Grid
AF Amp. Plate
Audio Output Grid
Bias Network
Decoupling
Sync. Amp. Grid
Sync. Amp. Plate
1st Sync. Sep. Cathode
1st Sync. Sep. Plate
2nd Sync. Sep. Cathode
2nd Sync. Sep. Plate
Voltage Divider
3rd Sync. Sep. Grid
3rd Sync. Sep. Cathode
3rd Sync. Sep. Cathode
3rd Sync. Sep. Plate
3rd Sync. Sep. Plate
Voltage Divider
Integrator
Integrator
Vert. Osc. Grid
Vert. Osc. Plate
Vert. Peaking
Vert. Output Grid
Vert. Output Cathode
Vert. Output Decoupling-Wire Wound
Horiz. Feedback
Horiz. Feedback
Horiz. AFC Diode Load
Horiz. AFC Diode Load
Horiz. AFC Diode Load
Horiz. AFC Diode Load
Horiz. AFC Filter
Horiz. Phase Inv. Cathode
Horiz. Phase Inv. Plate
Horiz. Osc. Grid
Horiz. Disch. Plate
Horiz. Disch. -See Note 4
Horiz. Output Grid
Horiz. Output Cathode-Wire Wound
Horiz. Output Screen
Damper Filter-Wire Wound
Isolation
Filter Network
Interlock Diode Load
Interlock Diode Load
Voltage Divider
Voltage Divider
Voltage Divider
Interlock Control Tube Grid
Filter Network
Bias Network
Focus Coil Shunt-Wire Wound
Focus Coil Shunt-Wire Wound
Filter-Wire Wound
Filter-Wire Wound
Surge Limiter-Wire Wound
Surge Limiter-Wire Wound
Surge Limiter-Wire Wound
Filter-Wire Wound
Filter-Wire Wound

RESISTORS (CONT.)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	EMERSON PART No.	IRC PART No.	
R126	390KΩ	1		BTA-390K	HV Osc. Grid
R127	220KΩ	1		BTA-220K	HV Osc. Cathode
R128	330Ω	½			Parasitic Suppressor
R129	330KΩ	½		BTS-330K	HV Output Grid
R130	390Ω	2		BW-2-390	HV Output Cathode
R131	18KΩ	1		BTA-18K	Voltage Divider
R132	330Ω	½			Parasitic Suppressor
R133	47KΩ	½	340892	BTS-47K	Bias Filter
R134	220KΩ	½	341052	BTS-220K	Bias Filter
R135	47KΩ	½	340892	BTS-47K	Horiz. Osc. Grid-See Note 5
R136	3300Ω	½	344097	BTS-3300	1st Video Amp. Cathode-See Note 5
R137	47KΩ	½	340892	BTS-47K	Isolation

Note 1. Some models use a 1000Ω resistor in this application.
Note 2. Some models use a 68Ω resistor in this application.
Note 3. Some models use two 4700Ω, 1 watt resistor in series to obtain required resistance and wattage.
Note 4. Some models use a 10KΩ resistor in this application.
Note 5. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 2.3A	680VCT .067ADC	5VAC @ 2A	5VAC @ 3A SEC. 4 6.3VAC @ 9.5A	730014-1			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	DC RESISTANCE		EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.					
T2	162Ω	1350Ω	738004	A-8111 ①	A-3000 ①	TBO-2 ①	Vert. Block Osc. Trans.
T3	9Ω	3.7Ω	738042	A-8110	A-3002 ①		Hor. Block Osc. Trans.
T4A	430Ω	10.4Ω	738013	A-8117 ②	HVO-1 ②	TFB-1 ②	Hor. Output Trans.
	Tap @ 175Ω	Tap @ .6Ω					
		SEC. 2					
		0Ω					
B			738012				Hor. Output Trans. (Alt)
T5	570Ω	7Ω	738010-1	A-8115 ①	A-3035 ①	TSO-1 ①	Vert. Output Trans.
T6A	15Ω		③				Hor. Deflection Coil
B	60Ω						Vert. Deflection Coil
T7	290Ω		③				Focus Coil
T8	145Ω	120Ω	④				HV Block Osc. Trans.

① Drill one new mounting hole.
② Do not use HV tap or HV filament winding.
③ Part of projection unit Part #470421.
④ Part of HV power supply Part #470419.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T9	4800Ω	4.1Ω	335Ω	.7Ω	734018	A-3823 ①	A-3019	RO-8 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	EMERSON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	4.1Ω	180050		12A4A	
	CONE DIA.	V. C. DIA.				
SP2	11 7/8"	1"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.170ADC	100Ω	3.7 Henries	737011	C-1410 ①	C-2991 ①	TR-4200①	① Drill one new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	EMERSON PART No.	MEISSNER PART No.	
L2	Ant. Coil	0Ω	0Ω			Part of tuner #470469-1
L3	RF, Mixer Grid & Osc.	0Ω				Part of tuner #470469-1
L4	1st Video IF Primary	.2Ω		720056		Includes L5
L5	1st Video IF Secondary	.2Ω		720056		Includes L4
L6	Fil. Choke	.1Ω				Part of tuner #470469-1
L7	Fil. Choke	.1Ω				Part of tuner #470469-1
L8	2nd Video IF	.4Ω	0Ω	720042		
L9	2nd Video IF Grid Choke	3Ω		705014		
L10	3rd Video IF	.4Ω	.1Ω	720042		
L11	3rd Video IF Grid Choke	3Ω		705014		
L12	4th Video IF	.3Ω		720078		Alternate #720079
L13	RF Choke	4.8Ω		708097		
L14	5th Video IF	.3Ω		720078		Alternate #720079
L15	Peaking	6Ω		708096	19-1920	75 microhenries
L16	Peaking	13.5Ω		708099	19-1923	330 microhenries -white dot
L17	Peaking	10.5Ω		708095	19-1921	180 microhenries-blue dot
L18	Peaking	8.9Ω		708099	19-1923	330 microhenries-green dot
L19	Peaking	8.9Ω		708092	19-1921	150 microhenries-two green dots
L20	Peaking	8.3Ω		708094	19-1921	125 microhenries-green dot
L21	1st Sound IF	4.9Ω		708097		White dot
L22	2nd Sound IF	2.2Ω	2.2Ω	720081		
L23	Disc. Trans.	1.7Ω	1.7Ω	708018		Alternate #708017
L24	RF Choke	52Ω		705009		3 microhenries
L25	Horiz. Lin.	39Ω		708003		
L26	Horiz. Size	.2Ω		708082		
L27	HV Output Cath. Choke	.1Ω				Part of HV unit #470419
L28	Fil. Choke	.1Ω				Part of HV unit #470419

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	EMERSON PART No.	SYLVANIA PART No.	SELETRON PART No.	
M1	.170ADC	817005	NE-5	5R1	
M2	.170ADC	817005	NE-5	5R1	
M3	.210ADC	817004	NF-5	5Q1	
M4	.210ADC	817004	NF-5	5Q1	

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M5A	RF Tuner	470469-1	
B	RF Tuner	470452	
M6	Fuse	808170	.25A 250V Type 3AG
M7	HV Unit	470419	
	Trimmer	900044	3-35MMF 1st Sound IF
	Mirror	635027	
	Screen	450086	
	Optical Box	470481	
	Cabinet	140350	
	Knob	450051-13	Channel selector
	Knob	450044	Fine tuning
	Knob	450046S	Brightness focus
	Knob	450045	Vert. hold, contrast
	Knob	4500413	Horiz. hold, Off-Volume

OPTICAL ADJUSTMENTS

This operation should be necessary only when replacing the 3NP4 or the focus and deflection coils.

Before turning on the set, turn both contrast and brightness controls fully off. After about one minute slowly advance the controls for a medium bright raster. (If a spot or line appears on the screen, immediately turn brightness control fully off and determine cause of sweep failure.)

Adjust the focus control for the best possible focus on the face of the tube. This is necessary since no amount of mechanical focus can correct a defocused image on the face of the tube.

Adjust the centering controls to center picture on the face of the tube. If mechanical centering is required in addition to the electrical centering, adjust the two centering screws B1. While adjusting these screws, be careful not to force the focus coil against the neck of the tube by tilting it excessively in either direction. With the raster centered on the face of the tube the image should be centered on the viewing screen. Many test patterns have wedges or arrows which indicate the edges of the picture. If a pattern having these marks is being received, they can be used for checking the centering. If picture is not properly centered on the viewing screen loosen the three mounting bolts of the projection unit and adjust the three leveling screws B2 to center the pattern on the viewing screen.

If the pattern tilts on the screen, loosen the four mounting bolts and rotate the mounting assembly slightly as required. Tighten the mounting bolts.

Check to see that the pattern is still in sharp focus on the face of the tube. The picture should also be in focus on the viewing screen. If it is not, loosen the five locking nuts about one turn each. Adjust the overall focusing adjustment B3 to focus the center of the picture. Adjust the horizontal focusing adjustment B4 for equal focus in the areas on each side of the center. Adjust the vertical focusing adjustment B5 for equal focus above and below the center. After each adjustment of B4 and B5 check the overall focus adjustment B3. Be careful adjustment of B3, B4 and B5 the entire pattern can be brought into focus. After completing the adjustments tighten the five locking nuts.

CAUTION: The screws on top of the projection unit are adjustments for the optical system inside the unit and UNDER NO CIRCUMSTANCES should they be disturbed. These adjustments or replacement of the optical parts must be done at the factory.

FIG. 4

HIGH VOLTAGE OSCILLATOR ADJUSTMENTS

The blocking oscillator frequency in the high voltage supply should be maintained at 1000 cycles (± 70 cycles). Unless a component that determines frequency has been altered or replaced, adjustment is not usually necessary. The frequency should be checked if the 6SR7 tube (V23) or any of the associated parts have been replaced.

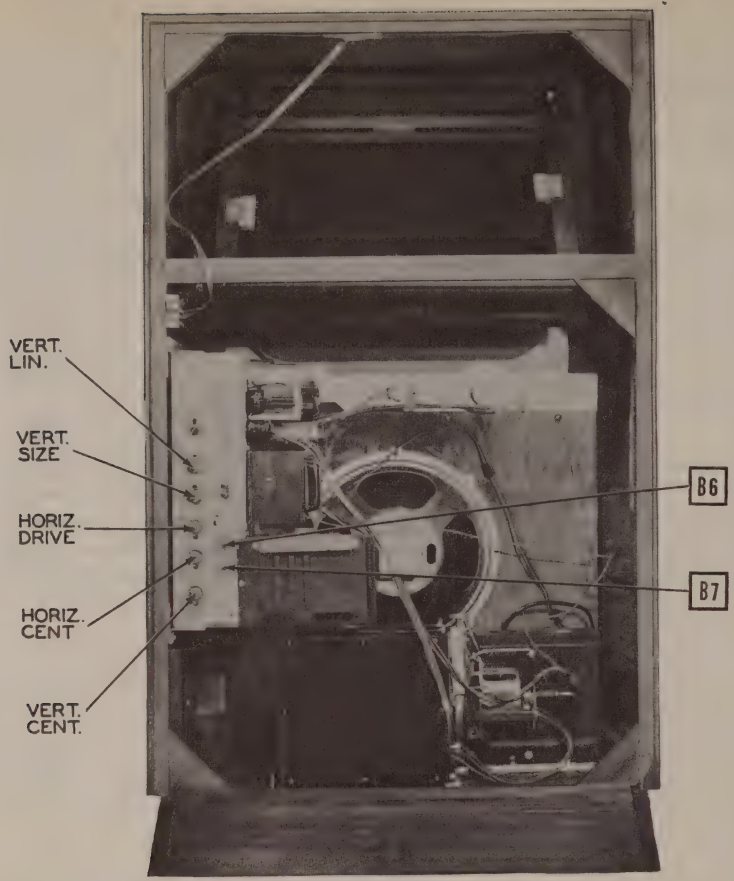
The 1000 cycle adjustment controls the oscillator frequency which determines the filament supply of the three sealed rectifier but has little effect on current regulation and voltage output.

Insert a 10Ω resistor in the B+ lead as shown on the schematic and connect the vertical amplifier of the scope between point D and the chassis. Feed a 1000 cycle signal from an audio generator to the horizontal sweep amplifier of the oscilloscope. Adjust B8 for a single stable Lissajous pattern as shown in figure 4. Be sure to remove the 10Ω resistor after the adjustment is made.

HORIZONTAL WIDTH AND LINEARITY ADJUSTMENTS

Adjust the horizontal size slug (B6) until the picture fills the mask horizontally.

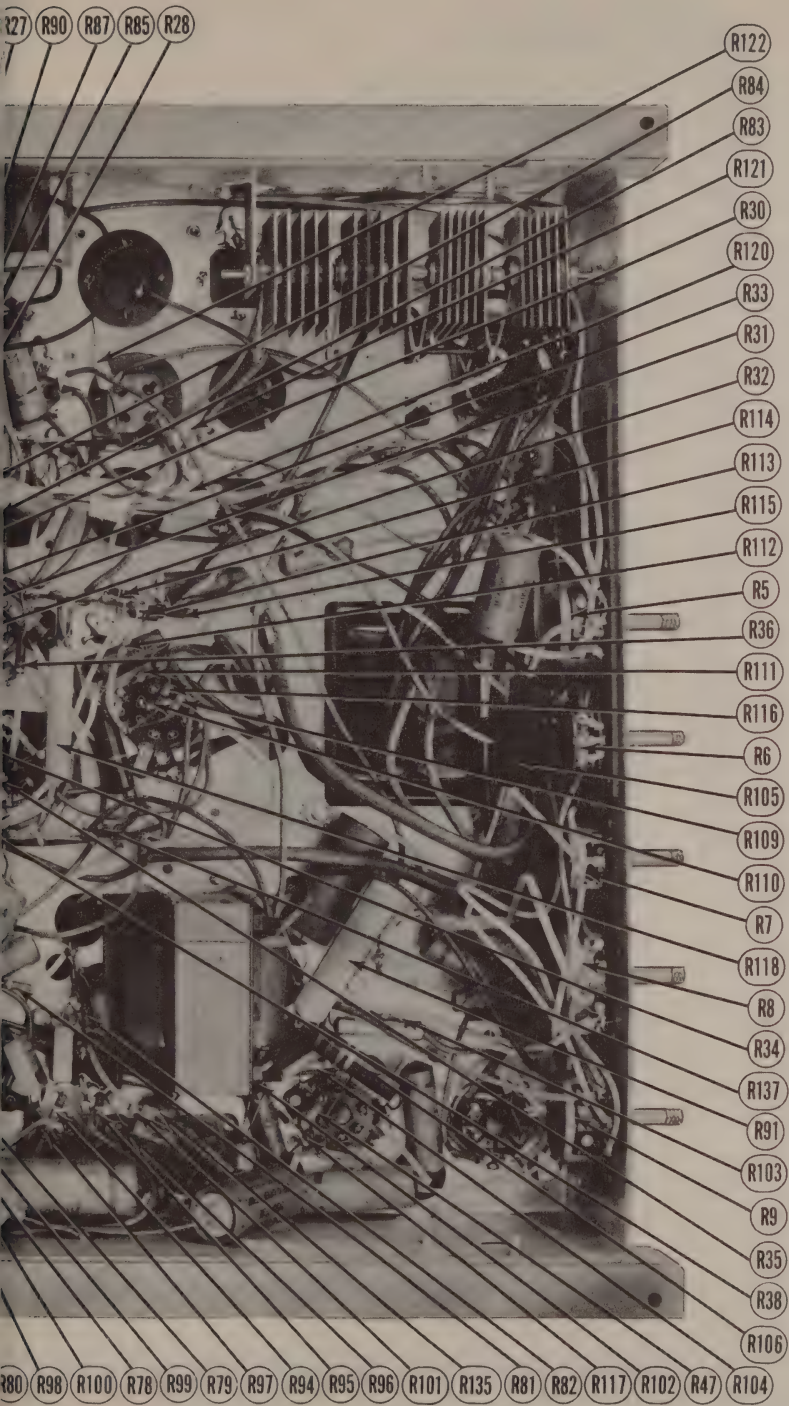
Adjust the horizontal linearity slug (B7) and the horizontal drive control for best linearity from left to right. If the horizontal drive control is changed, readjustment of B6 may be necessary.



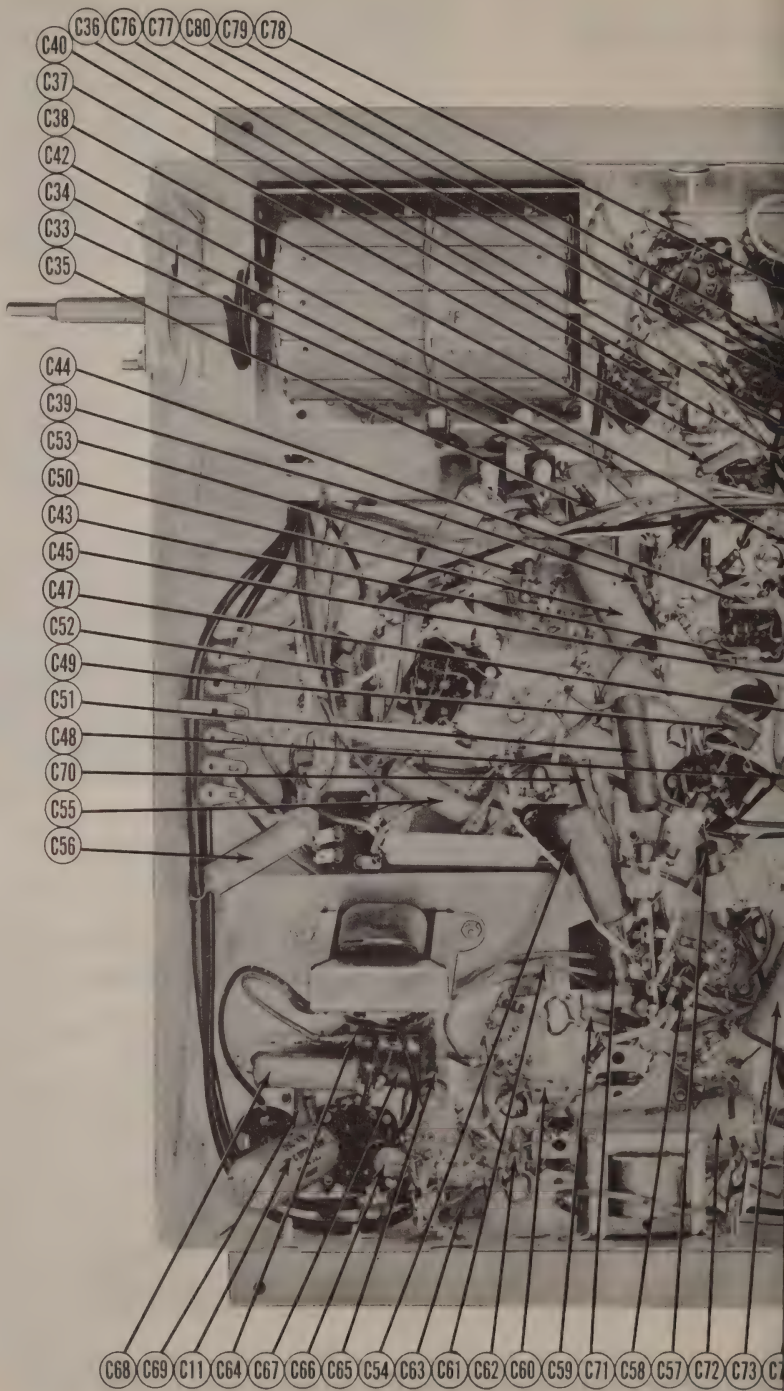
CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

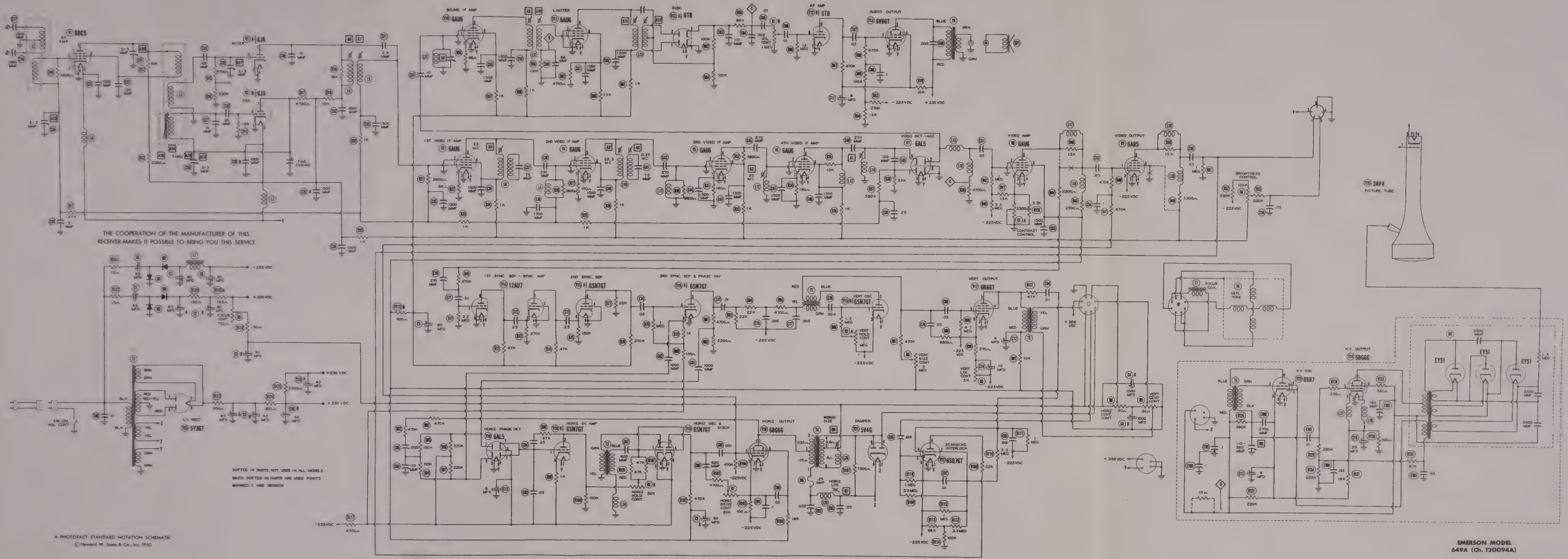
1. Remove eight control knobs from front of cabinet.
2. Remove ten wood screws holding rear cover in place.
3. Disconnect 110 volt input power line. Remove rear cover.
4. Disconnect built-in antenna.
5. Remove antenna terminal strip.
6. Remove power connections from chassis to high voltage supply and projection unit.
7. Remove two 5/16" hex bolts from control strip.
8. Remove two phillips head wood screws holding chassis in cabinet.
9. Remove three phillips head screws from projection unit. Remove unit.
10. Remove four 1/4" hex head screws from high voltage chassis. Remove HV unit.
11. Remove four 5/16" hex nuts from speaker. Remove speaker.



ESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DOTTED IN PARTS NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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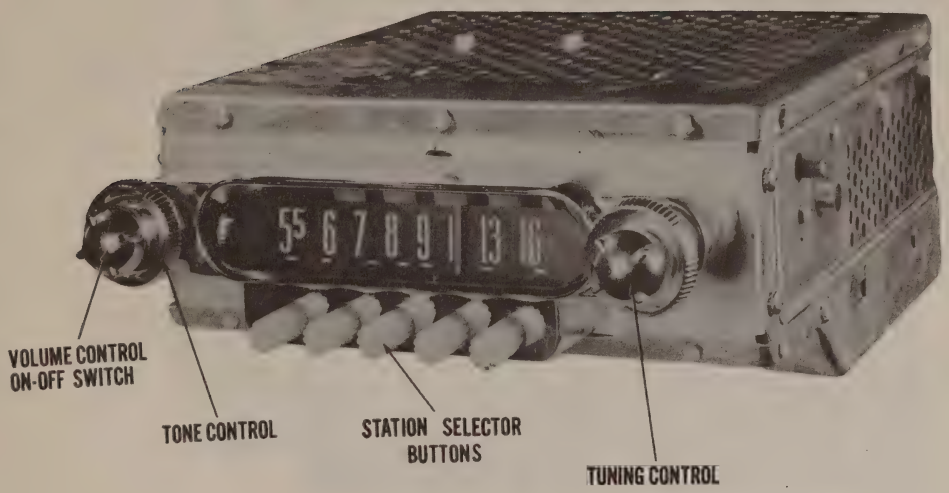
EMERSON MODEL 649A (Ch. 120094A)

FORD MODEL
M-1A-1 (OA-18805-A1)



FORD MODEL
M-1A-1 (OA-18805-A1)

FORD MODEL M-1A-1

TRADE NAME	Ford, Model M-1A-1 (0A-18805-A1)
MANUFACTURER	Bendix Radio, Div. of Bendix Aviation Corp., Baltimore, Maryland
TYPE SET	Battery Operated Custom Built Automotive Superheterodyne Receiver
TUBES (SIX)	Types 6SK7GT RF Amp., 6SA7GT Converter, 6SK7GT IF Amp., 6SQ7GT DET-AVC-AF, 6V6GT Power Output, 6X5GT Rectifier
POWER SUPPLY	6 Volt Storage Battery
RATING	5.2 Amp. at 6 Volts DC
TUNING RANGE—BROADCAST	540-1610KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

Connect a VTVM across the sensitivity control and adjust for a -2.5 volt reading.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 8 (Grid) of 6SA7 (V2). Low side to chassis.	262.5KC (400 ∿ Mod.)	High freq. end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	See fig 1.	High side thru dummy antenna to antenna receptacle. Low side to chassis.	1610KC	"	"	A5, A6, A7	"
3.	"	"	1400KC	Tune for max. output	"	A8, A9, A10	"
4.	TO SET DIAL POINTER TUNE RECEIVER TO 1300KC SIGNAL FROM SIGNAL GENERATOR AND ADJUST THE POINTER ADJUSTING CAM TO PLACE THE POINTER AT 1300KC ON DIAL SCALE.						
	AFTER ALIGNMENT IS COMPLETED, INSTALL RECEIVER IN CAR AND ADJUST A7 FOR MAXIMUM VOLUME WITH ANTENNA FULLY EXTENDED.						

PUSHBUTTON ADJUSTMENTS

To set push buttons loosen the push botton by turning it counter-clockwise not more than one turn. Tune in the desired station manually and press in the loosened pushbutton, and release. Tighten the pushbutton and repeat this procedure for the remaining pushbuttons for the desired station for each button.

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PARTS LIST AND DESCRIPTIONS

FORD MODEL M-1A-1

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: BENDIX PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.		6SK7GT	8N	
V2	Converter		6SA7GT	8R	
V3	IF Amp.		6SK7GT	8N	
V4	DET-AVC-AF		6SQ7GT	8Q	
V5	Power Output		6V6GT	7AC	
V6	Rectifier		6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: BENDIX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	20	350		AFH4H2G4A		UP2135C		TVL-3634	■ Filter
B	10	300							▲ Filter
C	20	25							Output Cath. Byp.
C2	100	500		1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	RF Coupling
C3	100	500		1469-0001	TCZ-100	5R5T1	NPOM-100	MS-31	Fixed Trimmer
C4	.1	400		P488-1	DF-104	PTE4P1		TM-1-4	Decoupling
C5	100	500		1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	RF Coupling
C6	270	500		1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	AVC Filter
C7	15			CN15JNPO	TCZ-15		NPOK-15	MS-415	Fixed Trimmer
C8	.1	200		P288-1	DF-104	PTE4P1		TM-1-2	AVC Filter
C9	100			GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Osc. Grid Cap.
C10	43			CN43JN750	TCN-43		N750L-43		Fixed Trimmer
C11	100	500		1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Conv. Fil. Byp.
C12	47	500		1468-00005	D6-470	5W5Q5	GP1K-47	1FM-45	IF Coupling
C13	.01	200		P488-01	D6-103	PTE4S1	811-01	TM-11-4	Audio Coupling
C14	68	500		1468-000075	D6-680	5W5Q7	GP1K-68	1FM-475	AF Amp. Grid Byp.
C15	.02	200		P488-02	DF-203	PTE4S2		TM-12-2	Tone Compensation
C16	.003	600		P688-003	D6-302	PTE6D3	GP2M-003	TM-23	Tone Compensation
C17	.01	400		P488-01	D6-103	PTE4S1	811-01	TM-11-4	Audio Coupling
C18	.002	600		P688-002	D6-203	PTE6D2	GP2M-002	TM-22	Output Plate Byp.
C19	.005	2000		2584-005				PX-252	Buffer
C20	.5	100		P185-5				68P20	Hash Filter

CONTROLS

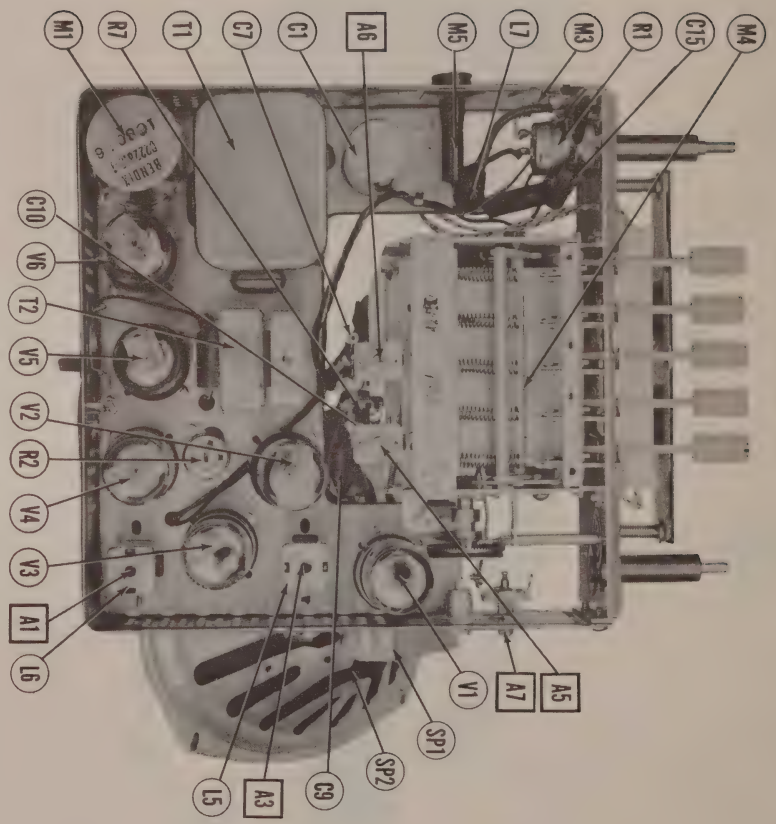
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: BENDIX PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½		Concentrikit			Tone control-front
B	250KΩ	½		B11-137 *			Volume control-tapped at 75KΩ-rear
C	Shaft End			B18-130X *			Attach per instr. in "concentrikit"
D	Bushing			E-187 *			Attach per instr. in "concentrikit"
E	Switch			S-5 *			Attach per instr. in "concentrikit"
R2	125Ω	1		76-1 *			Sensitivity control-Wire Wound

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: BENDIX PART No.	IRC PART No.	IDENTIFICATION CODES
R3	470KΩ	½		BTS-470K	RF Amp. Grid
R4	10KΩ	2		BTB-10K	Decoupling
R5	10KΩ	1		BTA-10K	AF Amp. Plate
R6	220KΩ	½		BTS-220K	Conv. Grid
R7	22KΩ	½		BTS-22K	Osc. Grid
R8	470KΩ	½		BTS-470K	IF Transformer Shunt
R9	150Ω	½		BTS-150	IF Amp. Cathode
R10	47KΩ	½		BTS-47K	Det. Diode Filter
R11	470KΩ	½		BTS-470K	AVC Network
R12	2.2 Meg.	½		BTS-2.2 Meg.	Det. Diode Load
R13	12KΩ	½		BTS-12K	Tone Compensation
R14	10 Meg.	½		BTS-10 Meg.	AF Amp. Grid
R15	1 Meg.	½		BTS-1 Meg.	AF Amp. Plate
R16	220KΩ	½		BTS-220K	Output Grid
R17	270Ω	1		BTA-270	Output Cathode
R18	1500Ω	2		BTB-1500	Filter
R19	10Ω	1		BW-1-10	Series Dial Lamp
R20	10Ω	1		BW-1-10	Series Dial Lamp
R21	82Ω	½		BTS-82	Hash Suppression
R22	82Ω	½		BTS-82	Hash Suppression

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	BENDIX PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6VDC @ 3.6A	520VCT .060ADC					P-4078 ②	

② Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		BENDIX PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	4400Ω	4Ω	630Ω	.5Ω		A-3877 ①	A-2930 ①	RO-8 ①	① Bend mounting tabs down and mount in original slots.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			BENDIX PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-812		
SP1	PM	4Ω		MOD. P69-S	69A2	
	CONE DIA.	V. C. DIA.				
SP2	6" x 9"	1"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	BENDIX PART No.	MEISSNER PART No.
L1	Ant. Coil	13Ω			
L2	RF Coil	13Ω			
L3	Osc. Coil	1.6Ω	3.7Ω		
L4	IF Trap	0Ω	0Ω		
L5	1st IF	31Ω	31Ω		16-6752
L6	2nd IF	38Ω	38Ω		16-6754
L7	Hash Choke	0Ω			
L8	Hash Choke	.2Ω			

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				INSTALLATION NOTES
				BENDIX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	Int.	6V	115 ∿		A-100	C-01	5300	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					BENDIX PART No.		
M2	Bayonet	6-8	.25	Blue			Type #44
M3	Bayonet	6-8	.25	Blue			Type #44

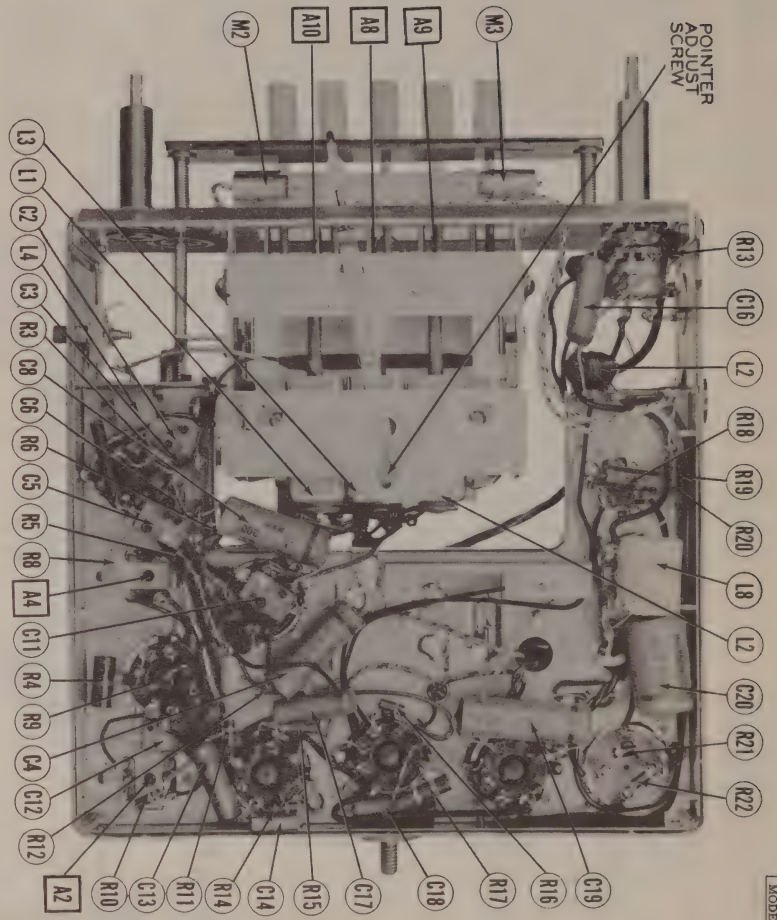
MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
M4	RF Tuner		
M5	Fuse		9 Amp.
M6	Spark Plate		
M7	Spark Plate		

SET 106

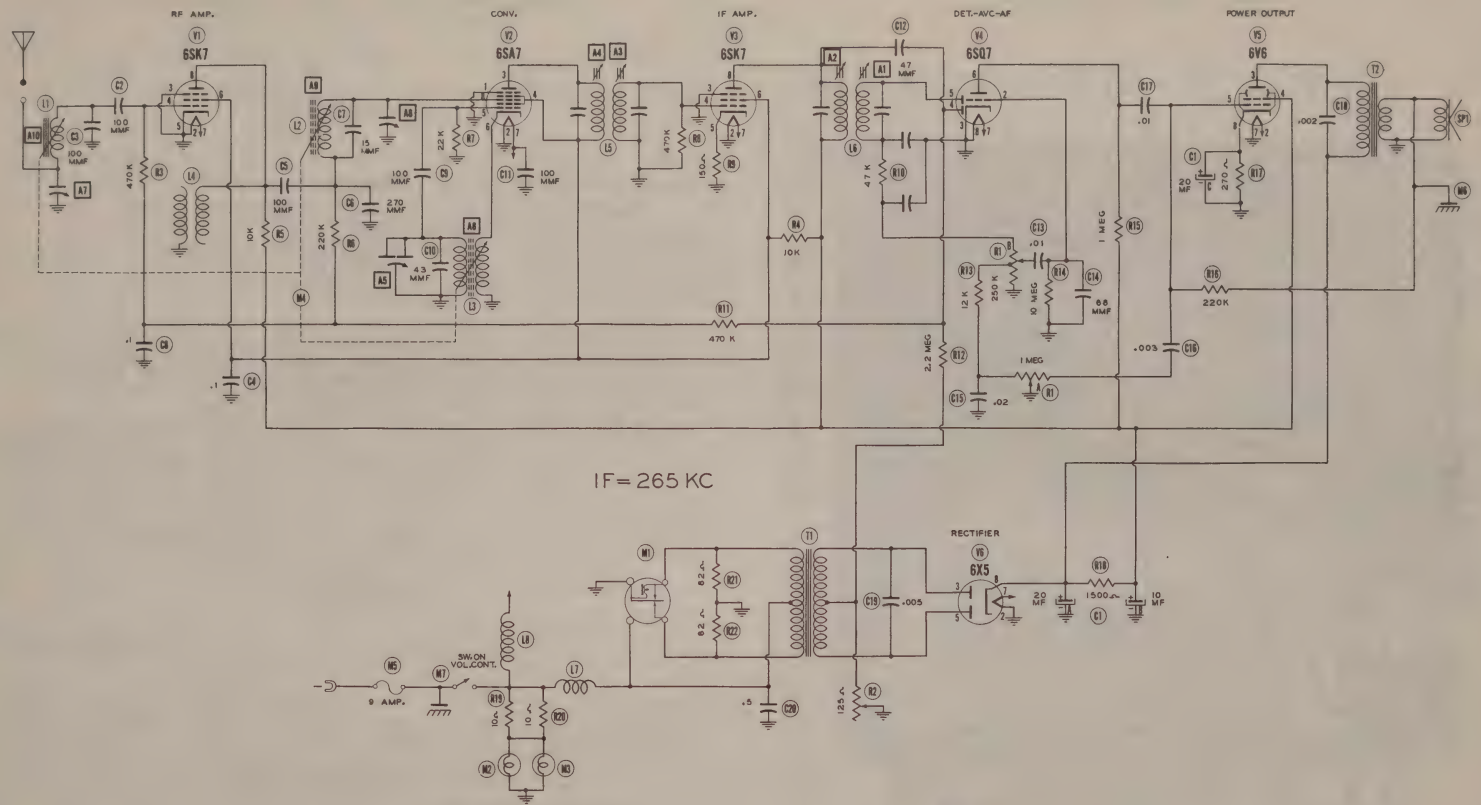
FOLDER 8

CHASSIS—BOTTOM VIEW



FORD MODEL M-1A-1

FORD MODEL M-1A-1



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SK7GT	0V.	0V.	0V.	-.5VDC	0V.	75VDC	6VDC	180VDC
V 2	6SA7GT	0V.	0V.	75VDC	75VDC	3-7.7VDC	0V.	6VDC	-.6VDC
V 3	6SK7GT	0V	0V.	0V.	0V.	1.6VDC	75VDC	6VDC	180VDC
V 4	6SQ7GT	0V.	-.6VDC	0V.	-.4VDC	-.3VDC	85VDC	6VDC	0V.
V 5	6V6GT	0V.	8VDC	205VDC	180VDC	0V.	0V.	0V.	8VDC
V 6	6X5GT	0V.	0V.	250VAC	0V.	250VAC	0V.	6VDC	325VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SK7GT	0Ω	0Ω	0Ω	2.7 Meg.	0Ω	†1MΩ	.4Ω	†1MΩ
V 2	6SA7GT	0Ω	0Ω	†1MΩ	†1MΩ	23KΩ	1.8Ω	.4Ω	2.4 Meg.
V 3	6SK7GT	0Ω	0Ω	0Ω	3IΩ	150Ω	†1MΩ	.4Ω	†1.5MΩ
V 4	6SQ7GT	0Ω	10 Meg.	0Ω	2.7 Meg.	300KΩ	†1 Meg.	.4Ω	0Ω
V 5	6V6GT	0Ω	.4Ω	†630Ω	†1.5KΩ	220KΩ	.5Ω	0Ω	270Ω
V 6	6X5GT	Inf.	0Ω	375Ω 500Ω	Inf.	375Ω 500Ω	Inf.	.4Ω	40KΩ

† MEASURED FROM PIN 8 OF V6.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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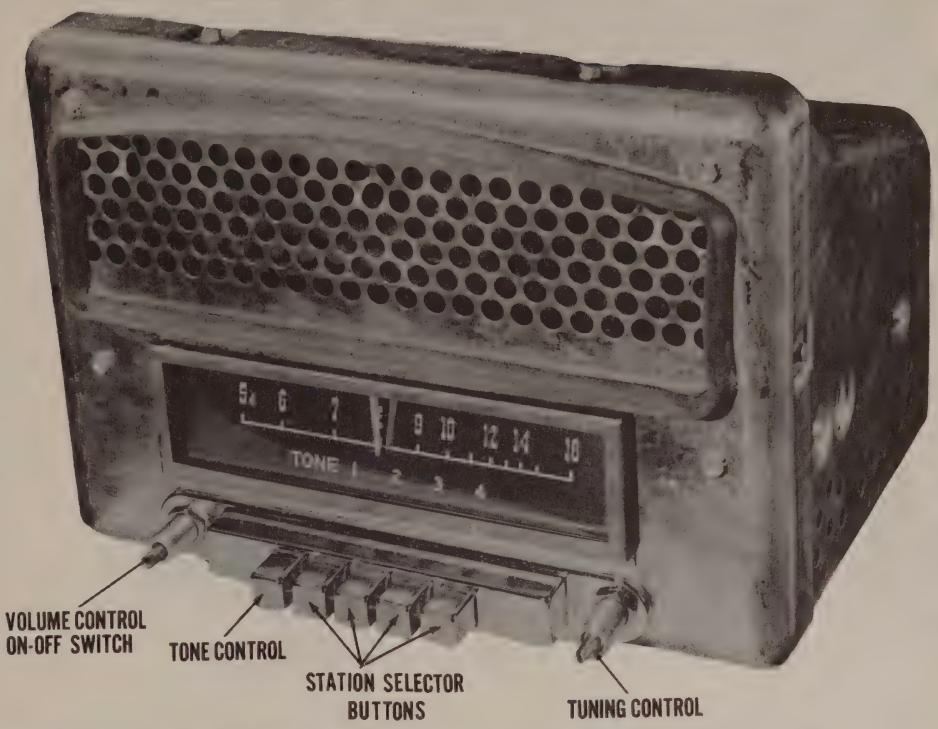
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



MOPAR MODEL 604

TRADE NAME	Mopar, Model 604
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Illinois
TYPE SET	Battery Operated Custom-Built Automotive Superheterodyne Receiver
TUBES (SIX)	Types 6BA6 RF Amp., 6BE6 Converter, 6BA6 IF Amp., 6AT6 DET-AVC-AF, 6V6GT Power Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 7 Amp. at 6 Volts DC
TUNING RANGE—BROADCAST	535-1605KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

Remove the dial scale and housing to expose alignment adjustment screws.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 6BE6 (V2). Low side to chassis.	455KC (400 ∿ Mod.)	High freq. end (cores out)	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	See fig 1.	High side thru dummy antenna to antenna receptacle. Low side to chassis.	1605KC	High freq. end (cores should project 1 1/8" from cans.	"	A5 , A6, A7	"
3.	"	"	1300KC	Set spacing between the treadle bar and tuner frame to 21/32"	"	A8, A9, A10	Adjust for maximum output. Replace dial scale and set pointer to 1300KC by adjusting the pointer adjustment eccentric.

AFTER RECEIVER IS INSTALLED IN CAR AND THE ANTENNA FULLY EXTENDED, SET THE DIAL TO 1400KC AND ADJUST A7 FOR MAXIMUM VOLUME OF A WEAK STATION OR NOISE.

PUSHBUTTON ADJUSTMENTS

To set push buttons pull off the chrome caps and turn the knurled button not more than two turns in a counter-clockwise direction. Tune in the desired station manually and push the push button in as far as it will go, and tighten the knurled button. Repeat this procedure for each push button for desired stations.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 1, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

MOPAR MODEL 604

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amp.	6BA6	6BA6	7BK	
V4	DET-AVC-AF	6AT6	6AT6	7BT	
V5	Power Output	6V6GT	6V6GT	7AC	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	30	350	23A473015	AFH6H6G4A		UP335-330C		TVL-3620	■ Filter ▲ Filter Output Cath. Byp.
B	30	300							
C	20	25							
C2	100		21B77562	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Fixed Trimmer
C3	.006	100	8C4529	P688-006	D6-562	PTE6D6		TM-26	RF Coupling
C4	.05	100	8K13514	P288-05	DF-503	PTE4S5		TM-15-2	AVC Filter
C5	.1	400	8K13166	P488-1	DF-104	PTE4P1		TM-1-4	Decoupling
C6	5		21K70720	GP5M	TCZ-4.7	5W5V5	GP1K-5	MS-55	RF Coupling
C7	50	500	21K74661	1468-00005	D6-500	5W5Q5	GP1K-50	1FM-45	Osc. Grid Cap.
C8	220		21K580276						Fixed Trimmer
C9	.05	100	8K13514	P288-05	DF-503	PTE4S5		TM-15-2	Cathode Bypass
C10	.05	100	8K13514	P288-05	DF-503	PTE4S5		TM-15-2	Audio Coupling
C11	.03	400	8K71911	P488-03	DF-203	PTE6S3		TM-13	Audio Coupling
C12	.006	400	8K71910	P488-006	D6-562	PTE6D6	811-005	TM-26	Tone Comp.
C13	500		21K481377	GP500M	D6-501	5W5T5	GP2K-500	1FM-35	Output Grid Byp.
C14	50	500	21K74661	1468-00005	D6-500	5W5Q5	GP1K-50	1FM-45	IF Coupling
C15	.006	400	8K71910	P488-006	D6-562	PTE6D6	811-005	TM-26	Output Plate Byp.
C16	.006	1600	8K12840	P1688-006		PTE16D6		MB-26	Buffer
C17	.5	100	8C580845	P185-5				68P20	Hash Filter
C18	.5	100	8C580845	P185-5				68P20	Hash Filter

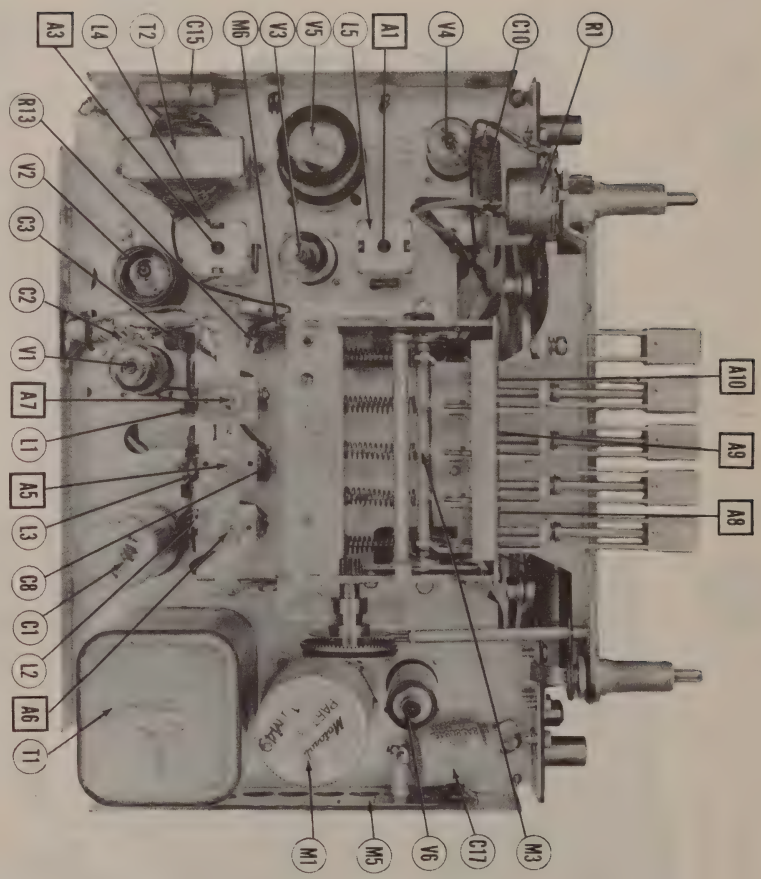
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1	500KΩ	½	18A48539				Volume control and switch

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES
R2	470KΩ	½	6R6032	BTS-470K	RF Amp. Grid
R3	100KΩ	½	6R6075	BTS-100K	Conv. Grid
R4	33KΩ	½	6R6012	BTS-33K	Osc. Grid
R5	270Ω	½	6R6432	BTS-270	RF Amp. Cathode
R6	6800Ω	1	6R6287	BTA-6800	Decoupling-Wire Wound
R7	390Ω	½	6R5554	BTS-390	IF Amp. Cathode
R8	1 Meg.	½	6R6004	BTS-1 Meg.	AVC Network
R9	47KΩ	½	6R6056	BTS-47K	Diode Filter
R10	1 Meg.	½	6R6004	BTS-1 Meg.	AVC Det. Diode Load
R11	3.3 Meg.	½	6R2118	BTS-3.3 Meg.	AF Amp. Grid
R12	6800Ω	½	6R6428	BTS-6800	AF Amp. Cathode
R13	27KΩ	½	6R6434	BTS-27K	Tone Compensation
R14	470KΩ	½	6R6032	BTS-470K	AF Amp. Plate
R15	470KΩ	½	6R6032	BTS-470K	Output Grid
R16	220Ω	1	6R6389	BTA-220	Output Cathode
R17	1000Ω	2	6R476004	BTB-1000	Filter
R18	10KΩ	½	6R6054	BTS-10K	Buffer
R19	56Ω	½	6R5614	BW-½-56	Hash Suppression
R20	56Ω	½	6R5614	BW-½-56	Hash Suppression

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6VDC @ 3.6A	500VCT .060ADC			25K580539		P-4071 ①	VT-1 ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	5500Ω	3.7Ω	320Ω	.4Ω	25B70171	A-3877	A-2930	RO-8	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	VIKING PART No.	QUAM PART No.	
	FIELD	V. C. IMP.				
SP1	PM	3.7Ω	50B485788 or 50B580176 or 50B580175	5739	57A15	
	CONE DIA.	V. C. DIA.				
SP2	5 x 7	9/16				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L1	Ant. Coil	14Ω		24B580278		Specify color of dot when ordering
L2	RF Coil	14Ω		24K580557		Specify color of dot when ordering
L3	Osc. Coil	.8Ω	4.7Ω	24B580279		Specify color of dot when ordering
L4	1st IF	19Ω	19Ω	24B485553	16-6758	
L5	2nd IF	19Ω	19Ω	24K485554	16-6758 †	† Add capacitor to ground from lug 4
L6	Hash Choke	.2Ω		24A472535		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				INSTALLATION NOTES
				MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	Int.	6V	115 ∿	48B3333	A-100	C-42	5300	

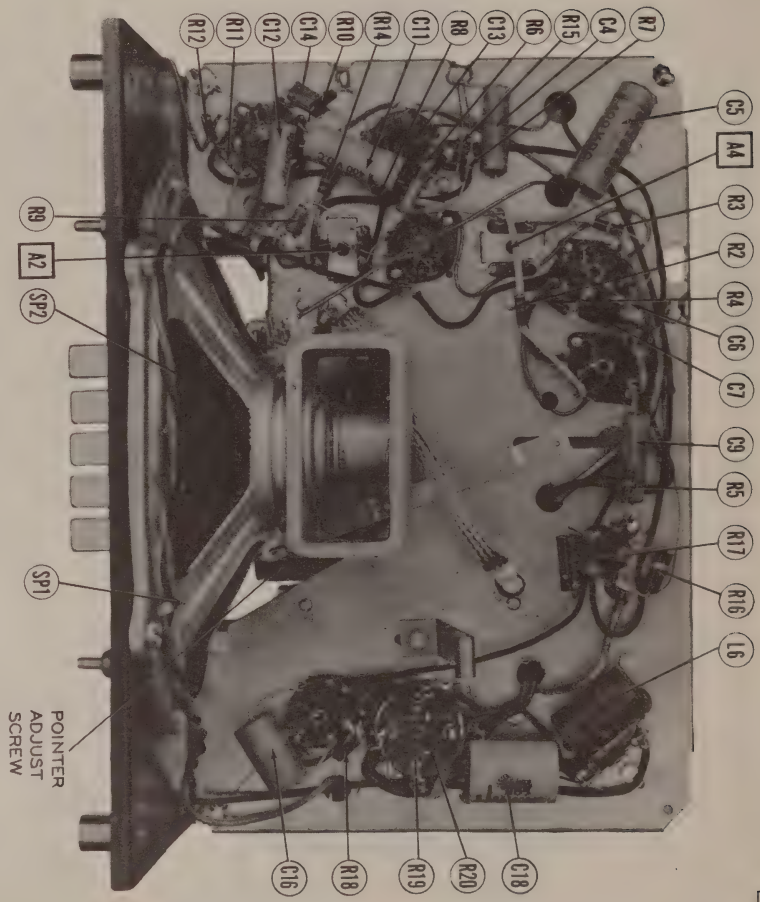
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M2	Bayonet	6-8	.25	Blue	65X10867		Type #44

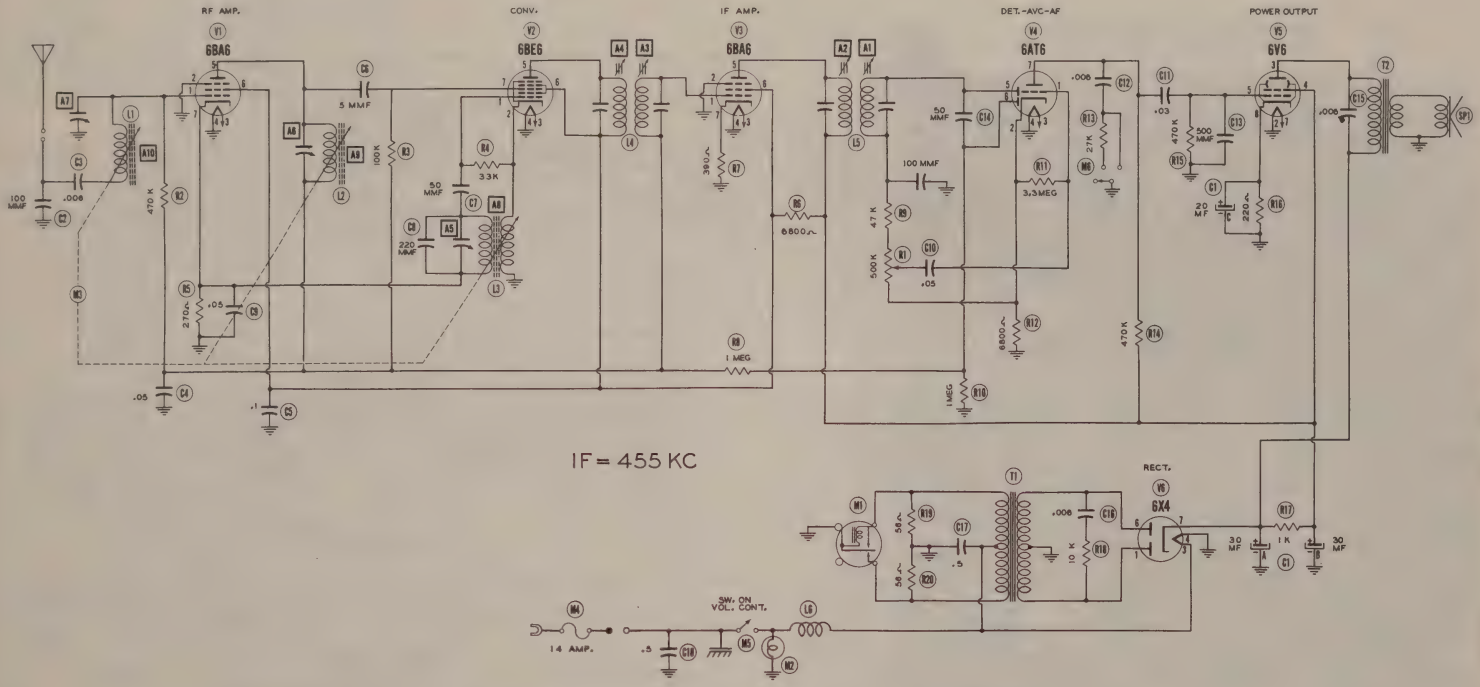
MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Tuner	51D590440	
M4	Fuse	65X12894	14 Amp.
M5	Spark Plate	1B485528	
M6	Switch	51X590123	Tone
A5	Trimmer	20A77537	Osc. Adj.
A6	Trimmer	20A481526	RF Adj.
A7	Trimmer	20A77536	Ant. Adj.
	Dial Pointer	52A580636	
	Dial Crystal	61K580238	
	Knob	1X580804	

CHASSIS—BOTTOM VIEW



MOPAR MODEL 604



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	0V.	0V.	6VDC	0V.	90VDC	90VDC	4VDC	
V 2	6BE6	1-3.8VDC	4VDC	6VDC	0V.	90VDC	90VDC	0V.	
V 3	6BA6	.1VDC	0V.	6VDC	0V.	180VDC	90VDC	2.6VDC	
V 4	6AT6	.1VDC	2VDC	6VDC	0V.	.8VDC	0V.	60VDC	
V 5	6V6GT	0V.	0V.	205VDC	180VDC	0V.	0V.	8VDC	8.3VDC
V 6	6X4	325VAC	320VAC	6VDC	0V.	0V.	325VAC	320VDC	

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	2.5 Meg.	0Ω	.4Ω	0Ω	†7.8KΩ	†7.8KΩ	270Ω	
V 2	6BE6	33KΩ	270Ω	.4Ω	0Ω	†7.8KΩ	†7.8KΩ	2.1 Meg.	
V 3	6BA6	2 Meg.	0Ω	.4Ω	0Ω	†1000Ω	†7.8KΩ	390Ω	
V 4	6AT6	3.3 Meg.	6.8KΩ	.4Ω	0Ω	550KΩ	1 Meg.	†470KΩ	
V 5	6V6GT	0Ω	0Ω	†320Ω	†1000Ω	470KΩ	Inf.	.4Ω	220Ω
V 6	6X4	380Ω	10KΩ	.4Ω	0Ω	Inf.	380Ω	50KΩ	

† MEASURED FROM PIN 7 OF V6.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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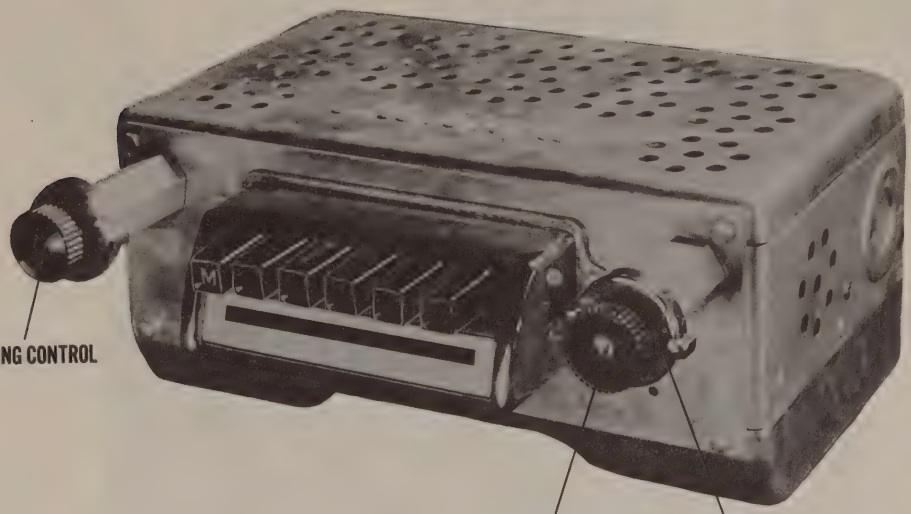
1. DC Voltage measurements are at 20, 000 ohms per volt ; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



MOTOROLA
CHASSIS 10A

MOTOROLA
CHASSIS 10A

MOTOROLA MODEL BKO-A

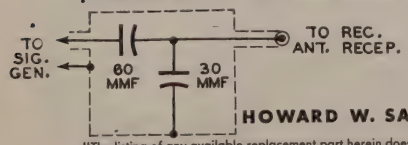
TRADE NAME	Motorola, Models BKO-A, CT8-A, GM9T-A, HNO, ILOT, PC9-A (Ch. 10A)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Illinois
TYPE SET	Battery Operated Universal Automotive Superheterodyne Receiver
TUBES (SIX)	Types 6BA6 RF Amp., 6BE6 Converter, 6BA6 IF Amp., 6AT6 DET-AVC-AF, 6AQ5 Power Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 6.5 Amp. at 6 Volts DC
TUNING RANGE—BROADCAST	535-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 6BE6 (V2). Low side to chassis.	455KC (400 ∿ Mod.)	Tuning cores fully open	Across voice coil	A1, A2 A3, A4	Adjust for maximum output.
2.	See fig 1.	High side thru dummy to antenna receptacle. Low side to chassis.	1610KC	"	"	A5, A6, A7	Check to see that tuning cores project 1 1/8 ins. out of the cans. Adjust A5, A6 and A7 for maximum output.
3.	"	"	1425KC	Set carriage 1 3/8" from front edge of coil forms.	"	A8, A9, A10	Adjust in the order given for maximum output.
4.	"	"	Turn gen. power off	Set carriage 17/32" from front edge of coil forms.	Not used	All	Adjust for maximum noise. If more than 1/2 turn is required, repeat steps 2, 3 and 4 until less than 1/2 turn is required.

AFTER SET IS INSTALLED, FULLY EXTEND THE ANTENNA AND TUNE IN A WEAK STATION NEAR 1400KC. ADJUST A7 FOR MAXIMUM VOLUME.



PUSHBUTTON ADJUSTMENTS

To set pushbuttons push the #1 button in as far as it will go and hold in that position. Tune in the station desired with the manual tuning knob and release button and knob after tuning in the station. Repeat this procedure to set the remaining four pushbuttons.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL BKO-A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		EIA BASE TYPE	INSTALLATION NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amp.	6BA6	6BA6	7BK	
V4	DET-AVC-AF	6AT6	6AT6	7BT	
V5	Power Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	30	350	23A473015	AFH6H6G4A		UP335-330		EL-323	■ Filter
B	30	350				C			▲ Filter
C	20	25							Output Cath. Byp.
C2	90		21B591682						Fixed Trimmer
C3	.006	100	8A4529	P488-006	D6-562	PTE6D6	GP2M-0056	TM-26	Ant. Coupling
C4	.05	100	6R13514	P288-05	DF-503	PTE4S5		TM-15	RF Cath. Byp. *
C5	.05	100	6R13514	P288-05	DF-503	PTE4S5		TM-15	Conv. Cath. Byp. *
C6	.05	400	6R14791	P488-05	DF-503	PTE4S5		TM-15	Decoupling
C7	.1	400	6R13166	P488-1	DF-104	PTE4P1		TM-1	Decoupling
C8	5		21K70720	GP5K	TCZ-4.7	5W5V5	NPOK-5	MS-55	RF Coupling
C9	50	300	21R6513	1468-00005	D6-500	5W5Q5	GP1K-50	1FM-45	Osc. Grid Cap.
C10	400		21A71872						Fixed Trimmer
C11	.05	100	6R13514	P288-05	DF-503	PTE4S5		TM-15	AVC Filter
C12	100		21B77562	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C13	100		21B77562	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C14	5		21K70720	GP5K	TCZ-4.7	5W5V5	NPOK-5	MS-55	IF Coupling
C15	.01	100	8R472754	P488-01	D6-103	PTE4S1	811-01	TM-11	Tone Comp.
C16	.05	100	6R13514	P288-05		PTE4S5		TM-15	Audio Coupling
C17	500	500	21R6639	1468-0005	D6-501	5W5T5	GP1K-500	1FM-35	AF Amp. Plate Byp.
C18	.006	400	8K71910	P488-006	D6-562	PTE6D6	GP2M-0056	TM-26	Tone Comp.
C19	.03	400	8R71911	P488-03		PTE6S3		TM-13	Audio Coupling
C20	.006	400	8K71910	P488-006	D6-562	PTE6D6	GP2M-0056	TM-26	Output Plate Byp.
C21	.006	1600	8K12840	P1688-006		PTE16D6		MB-26	Buffer
C22	.5	100	8K17028	P288-5		GT2P5		6SP20	Hash Filter
C23	.5	100	8K17028	P288-5		GT2P5		6SP20	Hash Filter

* Not used in all models.

CONTROLS

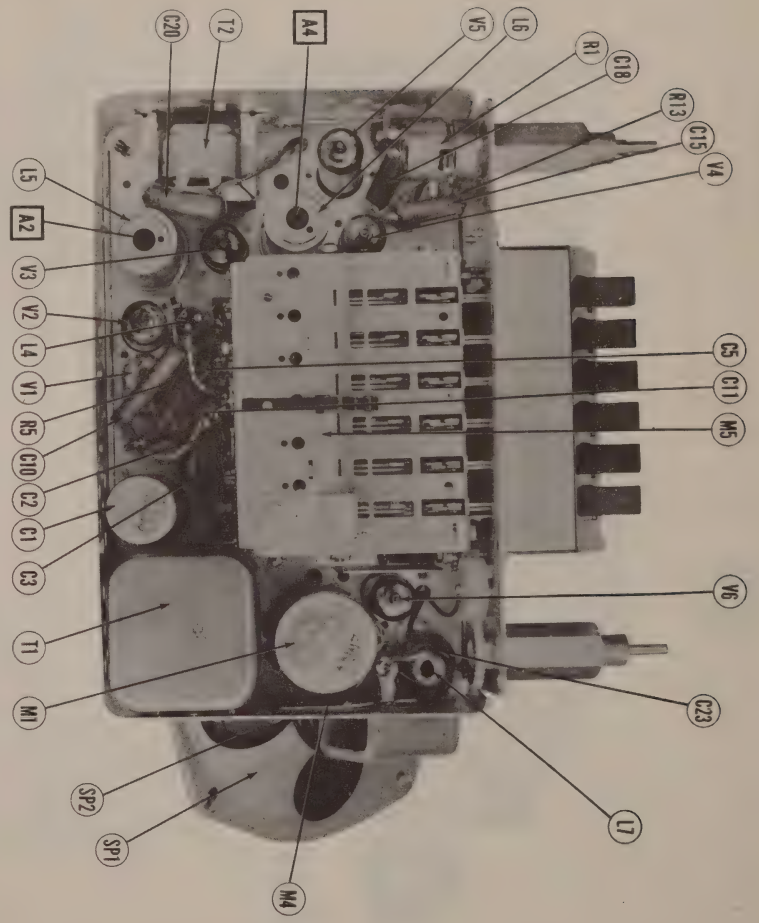
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	18A591550	Concentrikit B11-133 *		SBBT-563-S	Tone control-front
B	500KΩ	½		B18-133X *			Volume control-rear-tapped at 50KΩ
C	Shaft End	½		E-187 *			Attach per instr. in "Concentrikit".
D	Switch	½		76-2 * #			Attach per instr. in "Concentrikit".

* Additional parts to be used with "Concentrikit".
\# Wire both sections of switch in parallel. Use original sleeve bushing.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	
R2	470KΩ	½	6R6032	BTS-470K	RF Grid
R3	390Ω	½	6R5554	BW-½-390	RF Cathode
R4	100KΩ	½	6R6075	BTS-100K	Conv. Grid
R5	220Ω	½		BW-½-220	Conv. Cathode-See Note 1
R6	47KΩ	½	6R6056	BTS-47K	Osc. Grid
R7	10KΩ	2	6R476060	BT-2-10K	Screen Dropping
R8	390Ω	½	6R5554	BW-½-390	IF Cathode-See Note 2
R9	330Ω	½	6R6010	BW-½-330	Decoupling
R10	1 Meg.	½	6R6004	BTS-1 Meg.	AVC Network
R11	1 Meg.	½	6R6004	BTS-1 Meg.	Diode Load
R12	47KΩ	½	6R6056	BTS-47K	Diode Filter
R13	22KΩ	½	6R6028	BTS-22K	Tone Compensation

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

R14	2700Ω	½	6R5577	BTS-2700	Tone Compensation
R15	3.3 Meg.	½	6R2118	BTS-3.3 Meg.	AF Amp. Grid
R16	470KΩ	½	6R6032	BTS-470K	AF Amp. Plate
R17	220KΩ	½	6R6015	BTS-220K	Output Grid
R18	270Ω	1	6R6336	BW-1-270	Output Cathode
R19	1000Ω	2	6R476004	BW-2-1000	Filter
R20	10KΩ	½	6R6054	BTS-10K	Buffer
R21	56Ω	½	6R5614	BW-½-56	Noise Suppression
R22	56Ω	½	6R5614	BW-½-56	Noise Suppression

Note 1. Not used in all models.
Note 2. Some models use 150Ω resistor in this application.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	5.7VDC @ 3.4A	540VCT .061ADC			25B472533	P-6471	P-2972 ①	

① Drill one new mounting hole,

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	6KΩ	3.6Ω	340Ω	.3Ω	25B70171	A-3877	A-2930	RO-13 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.	50B473783	ST-110		
SP1	PM	3.8Ω	50B592352 ②	MOD. P6-V	6A1	② Used in model 1LOT
	CONE DIA.	V. C. DIA.				
SP2	6"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L1	Ant. Coil	11Ω		24B71881		Specify paint dot color when ordering
L2	RF Coil	11Ω		24B71881		Specify paint dot color when ordering
L3	Osc. Coil	2.8Ω		24B71879		Specify paint dot color when ordering
L4	Osc. Coil Padder	2.8Ω		24B70227		
L5	1st IF	14Ω	14Ω	24B485670	16-6678	Complete with capacitor and core, less shield
L6	2nd IF	14Ω	14Ω	24B485670	16-6678	Complete with capacitor and core, less shield
L7	Hash Choke	0Ω		24K591605		
L8	Hash Choke	0Ω		24A472535		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				INSTALLATION NOTES
				MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	Int.	6V	115 ∿	48B3333	A-200	C-00	5342	

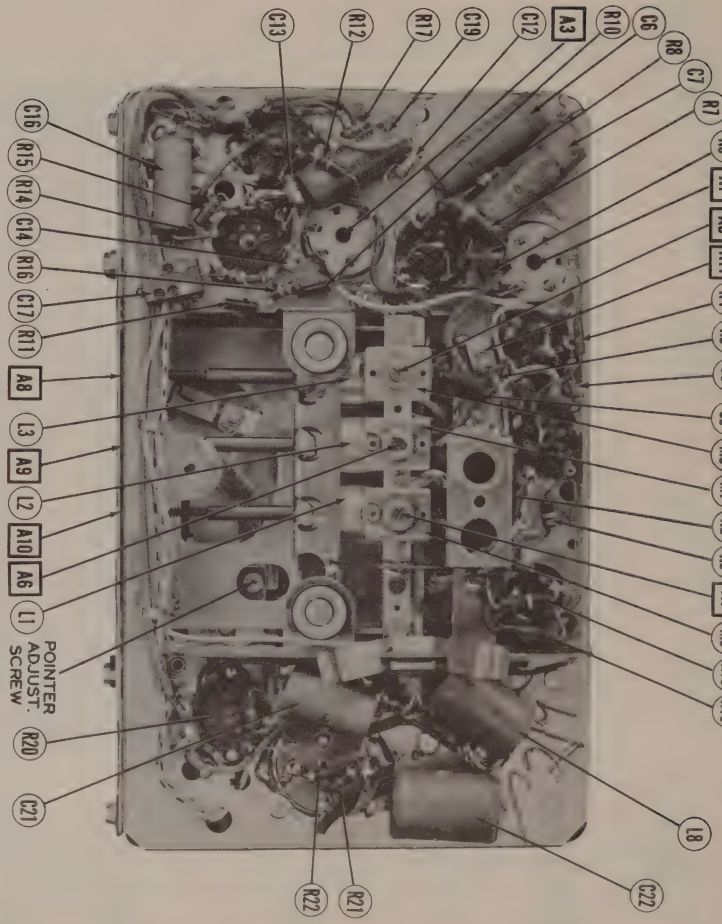
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M2	Bayonet	6-8	.25	Blue	65X10867		Type #44

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Fuse	55A10266	10 Amp. 3AG
M4	Spark Plate	1A472606	Assembly
M5	Tuner	1X472770	
M6	Trimmer Strip	20A480600	Ant. Adj. (A7)
M7			RF Adj. (A6)
M8			Osc. Adj. (A5)

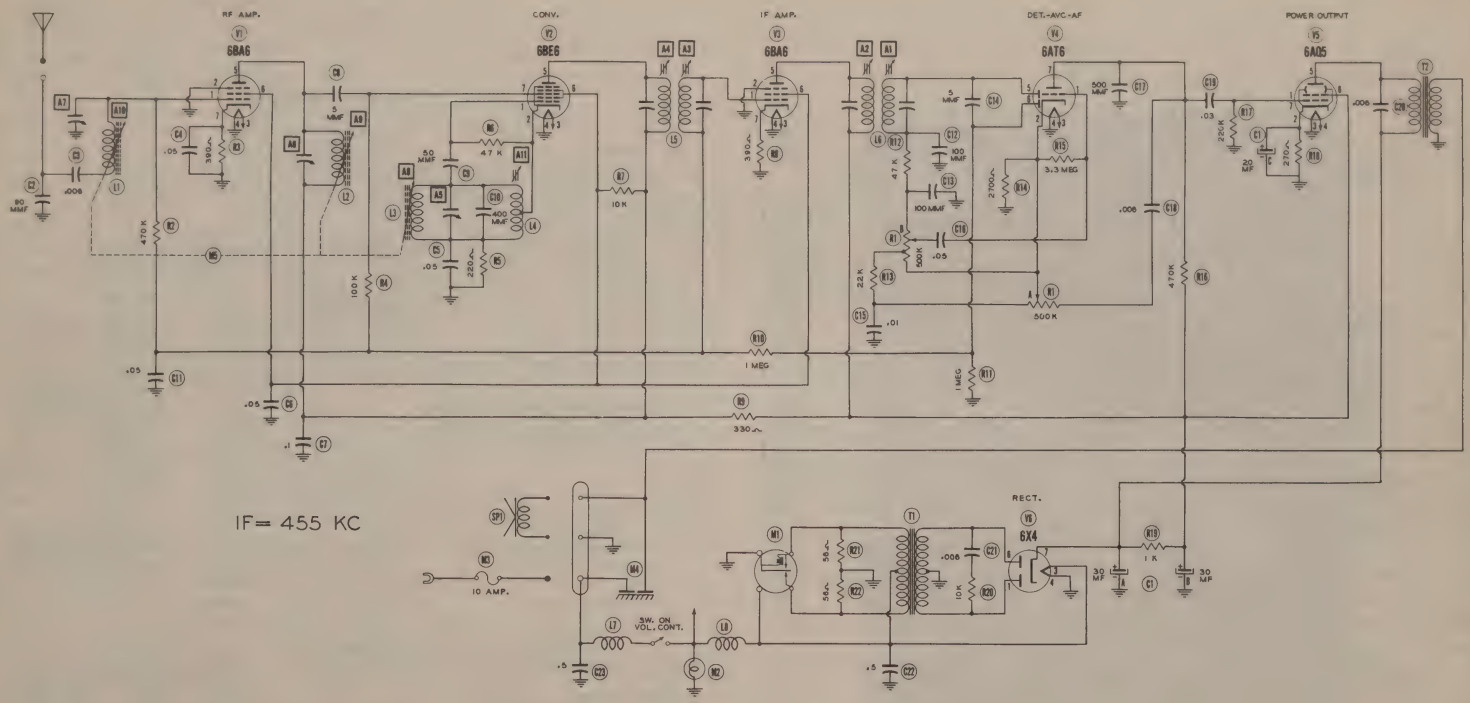
CHASSIS—BOTTOM VIEW



SET 109
FOLDER 10

MOTOROLA MODEL BKO-A

MOTOROLA MODEL BKO-A



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	0V.	0V.	6.3VDC	0V.	190VDC	95VDC	3.2VDC
V 2	6BE6	3-4.3VDC	1.9VDC	6.3VDC	0V.	190VDC	95VDC	0V.
V 3	6BA6	0V.	0V.	6.3VDC	0V.	195VDC	95VDC	3.2VDC
V 4	6AT6	0V.	1VDC	6.3VDC	0V.	.3VDC	0V.	60VDC
V 5	6AQ5	.2VDC	10VDC	0V.	6.3VDC	210VDC	195VDC	.2VDC
V 6	6X4	360VAC	355VAC	6.3VDC	0V.	6.3VDC	360VAC	325VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	2.5 Meg.	0Ω	.3Ω	0Ω	11.3KΩ	11.3KΩ	390Ω
V 2	6BE6	47KΩ	330Ω	.3Ω	0Ω	11.3KΩ	11.3KΩ	2 Meg.
V 3	6BA6	2 Meg.	0Ω	.3Ω	0Ω	11KΩ	11.3KΩ	390Ω
V 4	6AT6	3 Meg.	2.7KΩ	.3Ω	0Ω	500KΩ	1 Meg.	1470KΩ
V 5	6AQ5	330KΩ	270Ω	0Ω	.3Ω	1340Ω	11KΩ	330KΩ
V 6	6X4	360Ω	10.3KΩ	.3Ω	0Ω	.3Ω	360Ω	120KΩ

† MEASURED FROM PIN 7 OF V6.

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

*TRADE MARK

OLYMPIC MODELS
DX-214, DX-215, DX-216, DX-619, DX-620, DX-621, DX-622, DX-931, DX-932, DX-950

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MODEL DX-950

OLYMPIC MODELS
DX-214, DX-215, DX-216, DX-619, DX-620, DX-621, DX-622, DX-931, DX-932, DX-950

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PHOTOFACT* Folder

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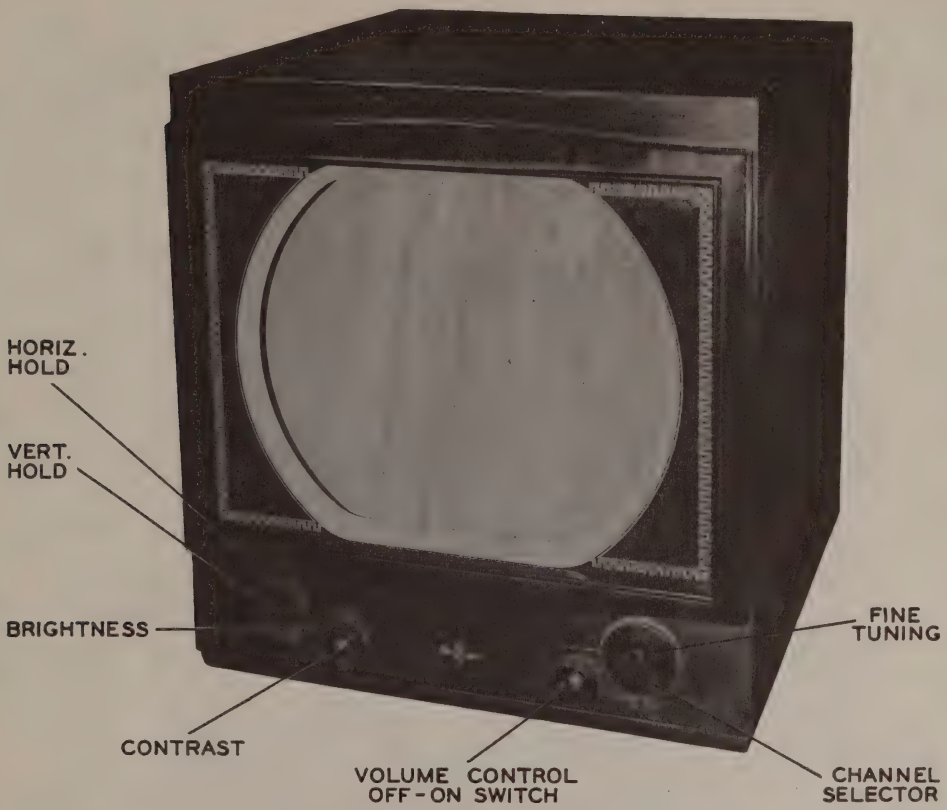

OLYMPIC MODEL DX-950

TRADE NAME	Olympic, Models DX-214, DX-215, DX-216, DX-619, DX-620, DX-621, DX-622, DX-931, DX-932, DX-950
MANUFACTURER	Olympic Radio and Television Inc., 34-01 38th Ave., Long Island City (1), New York
TYPE SET	Television Receiver
TUBES	Twenty Two (12" Models) Twenty Three (16" and 19" Models)
POWER SUPPLY	105-125 Volts AC-60 Cycle — RATING 1.9 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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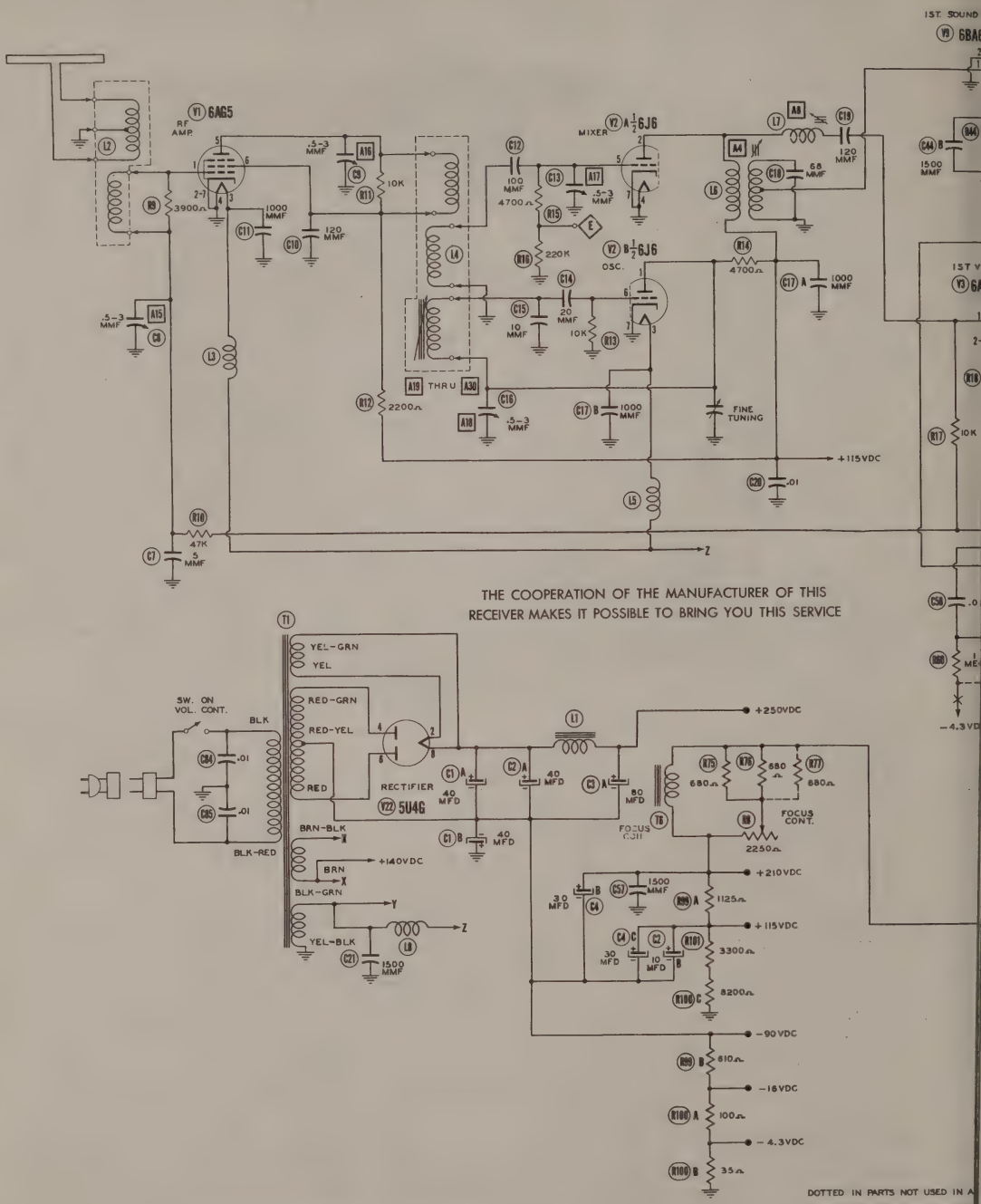
DATE 9-50 SET 106 FOLDER 11

OLYMPIC MODELS DX-214, DX-215, DX-216, DX-619, DX-620, DX-621, DX-622, DX-931, DX-932, DX-950



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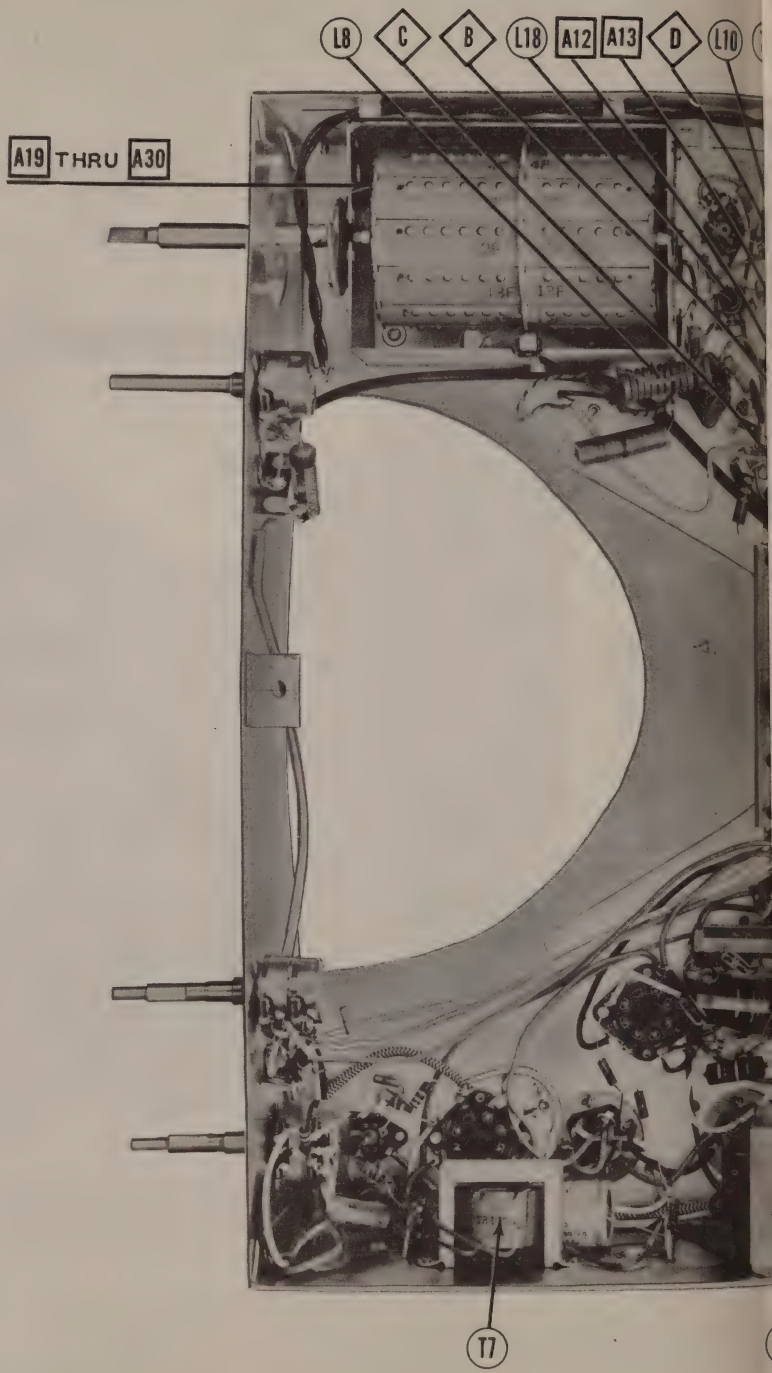
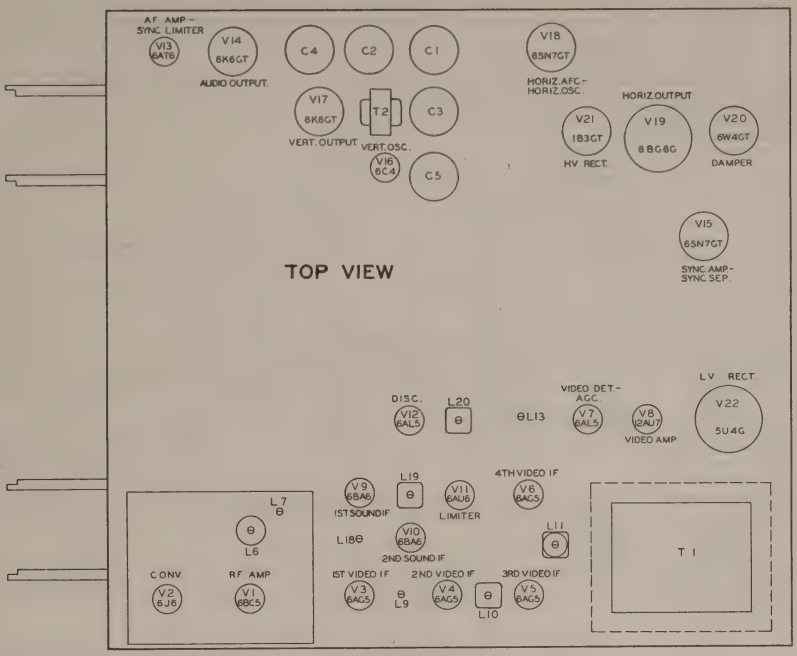
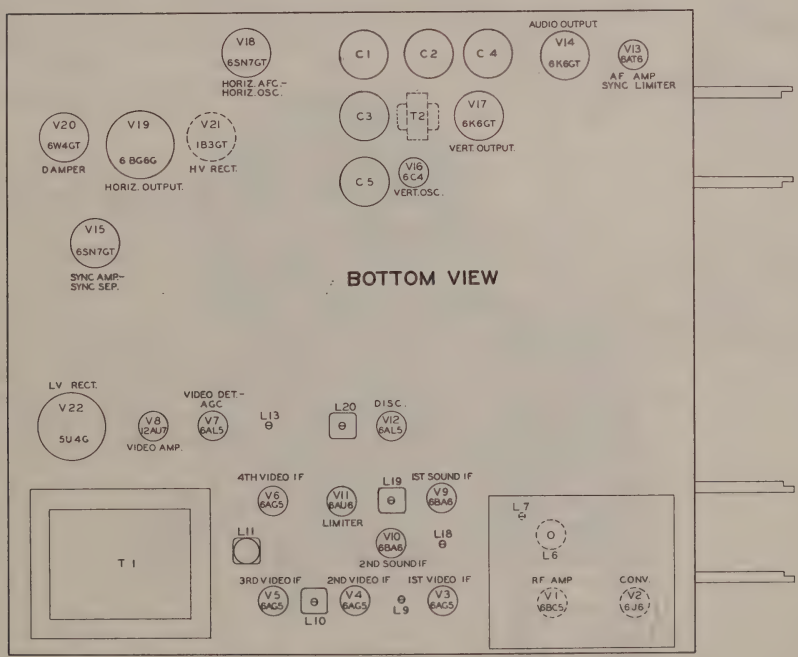
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDU





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard remove the horizontal output tube (V19) from its socket.
Before beginning alignment set the sensitivity switch (at rear of chassis) in "local" position and "phono-TV" switch in TV position.

VIDEO IF ALIGNMENT

Remove the converter tube V2 from its socket and replace with a 6J6 with pin 1 removed to prevent erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over "dummy" converter tube (V2). Low side to chassis.	19.75MC (Unmod.)	Any	DC Probe to Point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	Direct	"	27.25MC (Unmod.)	"	"	A2	"
3.	Direct	"	21.25MC (Unmod.)	"	"	A3, A4	"
4.	Direct	"	22.25MC	"	"	A5	Adjust for maximum deflection.
5.	Direct	"	25.5MC	"	"	A6, A7	"
6.	Direct	"	22.5MC	"	"	A8	"
7.	Direct	"	24MC	"	"	A9	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative terminal of a 1 1/2 volt battery to pin 2 of 6AL5 (V7) and positive terminal to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to ungrounded tube shield floating over "dummy" converter tube (V2). Low side to chassis.	23MC (10MC SWP)	25.75MC 22.5MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. The 25.75MC marker should be at 50% -60% response. If necessary slightly retouch A5 thru A9 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over "dummy" converter tube (V2). Low side to chassis.	21.25MC (Unmod.)	Any	DC Probe thru 100KΩ to Point (B). Common to chassis.	A10, A11, A12, A13	Adjust for maximum output. Attenuate signal generator to maintain a maximum -2 volts reading.
10.	Direct	"	"	"	DC Probe to Point (C). Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over "dummy" converter tube (V2). Low side to chassis.	21.25MC (450KC Sweep)	21.25MC	Any	Vert. Amp. to Point (D). Low side to chassis.	A10, A11, A12	Adjust for maximum amplitude and symmetry as per figure 2.
10.	Direct	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A13, A14	Adjust A14 to place 21.25MC at center of diagonal line as per figure 3. Adjust A13 for maximum amplitude and straightness of diagonal line.

RF AND CONVERTER ALIGNMENT

Connect 1 1/2 volt bias battery as used in overall video IF response check. Negative terminal to pin 2 of (V7), positive terminal to chassis.
Set the fine tuning control to the mid-position of its range.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point (E). Low side to chassis.	A15, A16, A17	Adjust for flat top response curve similar to figure 4 with markers not less than 70% of maximum amplitude of the curve.
12	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check response on all channels. A15, A16 and A17 may be adjusted slightly to obtain optimum response on all channels.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Replace converter tube with original 6J6 in its socket.

Complete alignment of the oscillator circuit may not be necessary. This is determined by checking to see that a zero reading is obtained for each channel when the fine tuning control is tuned through the midpoint of its range. (Connect signal generator and VTVM as in steps 13 and 14. Sound carrier frequencies are listed in step 14). If the majority of the channels seem to need oscillator alignment, this sometimes may be done in one operation-step 12- by adjusting A18. It should be noted that this is an all-channel adjustment and should not be adjusted for individual channels. If step 13 fails to align the oscillator circuits sufficiently, it will be necessary to adjust the oscillator coil slugs. These are accessible one channel at a time, through hole located to the right of the channel selector switch shaft.

Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	Direct	High side to one antenna terminal. Low side to chassis.	209.75MC	12	DC Probe to Point (E) Common to chassis.	A18	Adjust for zero reading between positive and negative peaks with fine tuning control at its midpoint. Rotate channel selector switch and adjust individual channels outlined in step 14. Then repeat step 13.
14.	Direct	"	215.75MC	13	"	A19	"
			209.75MC	12		A20	
			203.75MC	11		A21	
			197.75MC	10		A22	
			191.75MC	9		A23	
			185.75MC	8		A24	
			179.75MC	7		A25	
			87.75MC	6		A26	
			81.75MC	5		A27	
			71.75MC	4		A28	
			65.75MC	3		A29	
			59.75MC	2		A30	

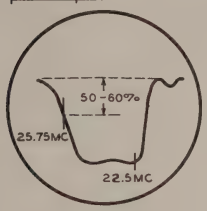


FIG.1

FIG. 2

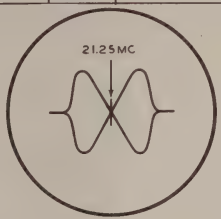


FIG. 3

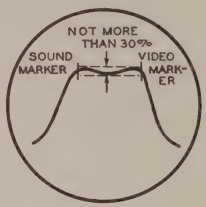
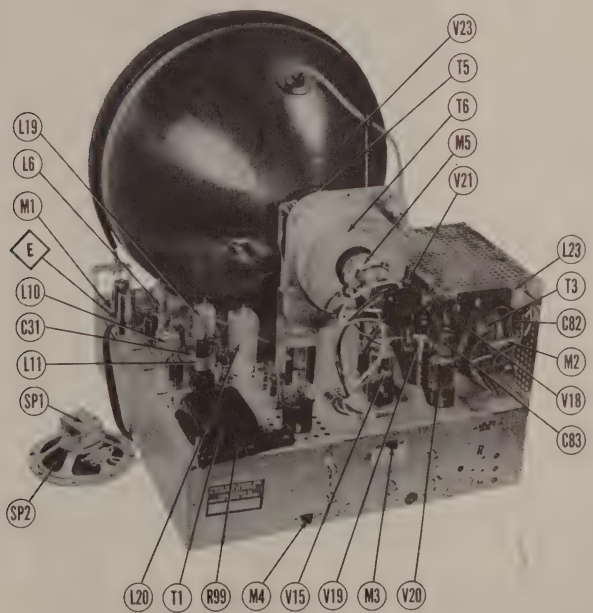


FIG. 4



CHASSIS-TOP VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	-.8VDC	0V.	6.3VAC	0V.	115VDC	100VDC	0V.		
V 2	6J6	75VDC	115VDC	6.3VAC	0V.	-1VDC	§-4.6VDC	0V.		
V 3	6AG5	-.3VDC	.3VDC	6.3VAC	0V.	110VDC	110VDC	.3VDC		
V 4	6AG5	-.3VDC	.3VDC	6.3VAC	0V.	110VDC	110VDC	.3VDC		
V 5	6AG5	.3VDC	.3VDC	6.3VAC	0V.	95VDC	110VDC	.3VDC		
V 6	6AG5	0V.	1.5VDC	0V.	6.3VAC	160VDC	145VDC	1.5VDC		
V 7	6AL5	0V.	-.4VDC	6.3VAC	0V.	0V.	0V.	-.3VDC		
V 8	12AU7	200VDC	-.8VDC	6VDC	6.3VAC	6.3VAC	48VDC	-83VDC	-80VDC	0V.
V 9	6BA6	0V.	0V.	0V.	6.3VAC	200VDC	110VDC	2VDC		
V 10	6BA6	0V.	0V.	0V.	6.3VAC	200VDC	110VDC	2.3VDC		
V 11	6AU6	-.4VDC	0V.	0V.	6.3VAC	55VDC	55VDC	0V		
V 12	6AL5	-.1VDC	-.3VDC	6.3VAC	0V.	0V.	0V.	-.3VDC		
V 13	6AT8	-.5VDC	0V.	0V.	6.3VAC	-.6VDC	0V.	60VDC		
V 14	6K6GT	0V.	6.3VAC	190VDC	195VDC	-12VDC	-16VDC	0V.	0V.	
V 15	6SN7GT	-.8VDC	135VDC	0V.	-.6VDC	210VDC	9VDC	6.3VAC	0V.	
V 16	6C4	120VDC 15VDC	0V.	6.3VAC	0V.	120VDC 15VDC	-100VDC	-90VDC		
V 17	6K6GT	-100VDC	0V.	230VDC	230VDC	-68VDC	0V.	6.3VAC	-50VDC -65VDC	
V 18	6SN7GT	-70VDC	4VDC	-85VDC	-160VDC	170VDC	-90VDC	6.3VAC	0V.	
V 19	6BG6G	0V.	6.3VAC	-80VDC	0V.	-100VDC	-95VDC	0V.	160VDC	TOP CAP *
V 20	6W4GT	-90VDC	350VDC	385VDC	250VDC	250VDC	0V.	6.3VAC	0V.	
V 21	1B3GT	* DO NOT MEASURE.								
V 22	5U4G	0V.	270VDC	0V.	265VAC	215VDC	265VAC	0V.	270VDC	
V 23	16DP4	¶	48VDC	PIN 10 380VDC	PIN 11 210VDC	PIN 12 ¶				

SENSITIVITY SWITCH IN "LOCAL" POSITION.
TV-PHONO SWITCH IN "PHONO" POSITION.
FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
¶ 6.3VAC MEASURED ACROSS FILAMENTS.
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.

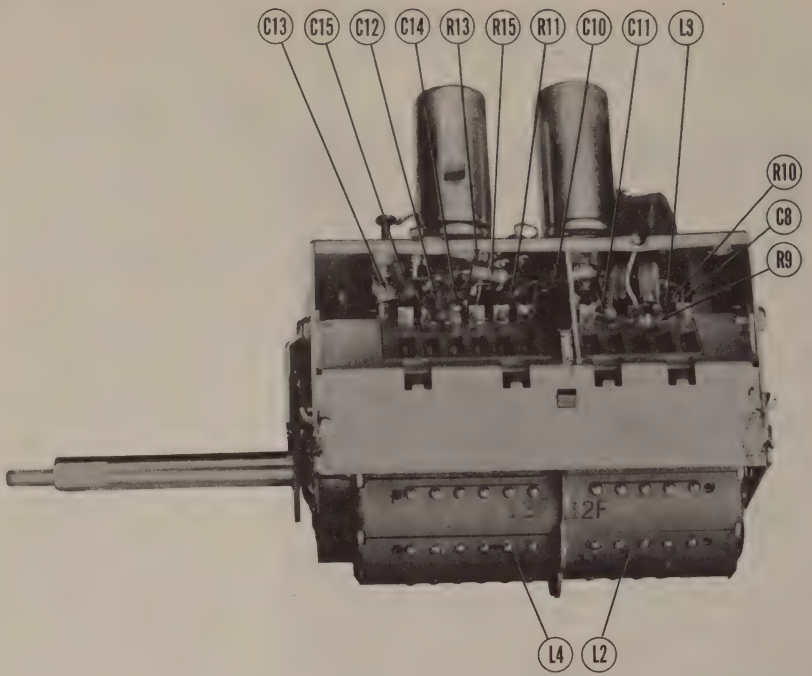
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	2 Meg.	0Ω	.1Ω	0Ω	†3.8KΩ	†3.8KΩ	0Ω		
V 2	6J6	†6.2KΩ	†1.5KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AG5	2 Meg.	39Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	39Ω		
V 4	6AG5	2 Meg.	39Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	39Ω		
V 5	6AG5	2 Meg.	39Ω	.1Ω	0Ω	†5.2KΩ	†2.5KΩ	39Ω		
V 6	6AG5	.2Ω	150Ω	0Ω	.1Ω	†7KΩ	†23KΩ	150Ω		
V 7	6AL5	.2Ω	1 Meg.	.1Ω	0Ω	12Ω	0Ω	5.6KΩ		
V 8	12AU7	†4.2KΩ	1 Meg.	2.7KΩ	.1Ω	.1Ω	†5.8KΩ	1 Meg.	1.3KΩ	0Ω
V 9	6BA6	0Ω	0Ω	0Ω	.1Ω	†1.3KΩ	†2.5KΩ	150Ω		
V 10	6BA6	22KΩ	0Ω	0Ω	.1Ω	†1.3KΩ	†2.5KΩ	150Ω		
V 11	6AU6	22KΩ	0Ω	0Ω	.1Ω	†11.5KΩ	†11.5KΩ	0Ω		
V 12	6AL5	200KΩ	100KΩ	.1Ω	0Ω	0Ω	0Ω	100KΩ		
V 13	6AT8	10 Meg.	0Ω	0Ω	.1Ω	3.9 Meg.	0Ω	†330KΩ		
V 14	6K6GT	Inf.	.1Ω	†1.6KΩ	†1.3KΩ	470KΩ	135Ω	0Ω	0Ω	
V 15	6SN7GT	1 Meg.	†22KΩ	0Ω	3.9 Meg.	†300Ω	6.8KΩ	.1Ω	0Ω	
V 16	6C4	#1 Meg. #2.5Meg.	Inf.	.1Ω	0Ω	#1 Meg. #2.5 Meg.	2 Meg.	745Ω		
V 17	6K6GT	2.2 Meg.	0Ω	†600Ω	†600Ω	2.2 Meg.	Inf.	.1Ω	6.8KΩ 1.8KΩ	
V 18	6SN7GT	750KΩ	#320KΩ	280KΩ	200KΩ	#80KΩ	745Ω	.1Ω	0Ω	
V 19	6BG6G	Inf.	.1Ω	845Ω	Inf.	1 Meg.	1 Meg.	0Ω	†5KΩ	TOP CAP #135Ω
V 20	6W4GT	700Ω	#10KΩ	200KΩ	†75Ω	†75Ω	Inf.	.1Ω	0Ω	
V 21	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #435Ω
V 22	5U4G	Inf.	12KΩ	Inf.	800Ω	†300Ω	800Ω	Inf.	12KΩ	
V 23	16DP4	†1.5KΩ	†5.8KΩ	PIN 10 #22KΩ	PIN 11 12KΩ	PIN 12 †1.5KΩ				

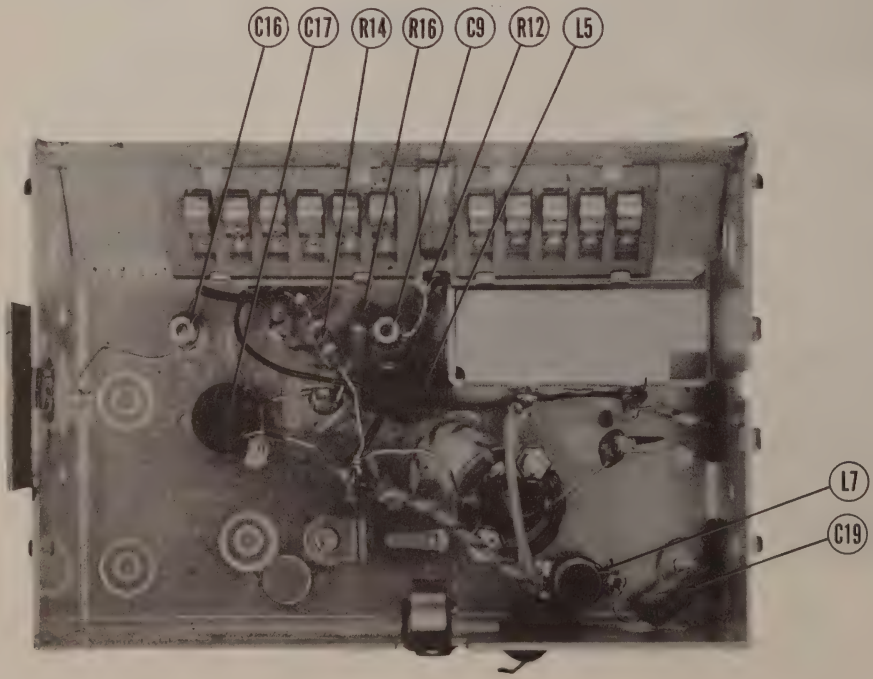
SENSITIVITY SWITCH IN "LOCAL" POSITION.
TV-PHONO SWITCH IN "TV" POSITION.
FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
† MEASURED FROM PIN 8 OF V22.
# MEASURED FROM PIN 3 OF V20.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

CTOR AND ALIGNMENT IDENTIFICATION

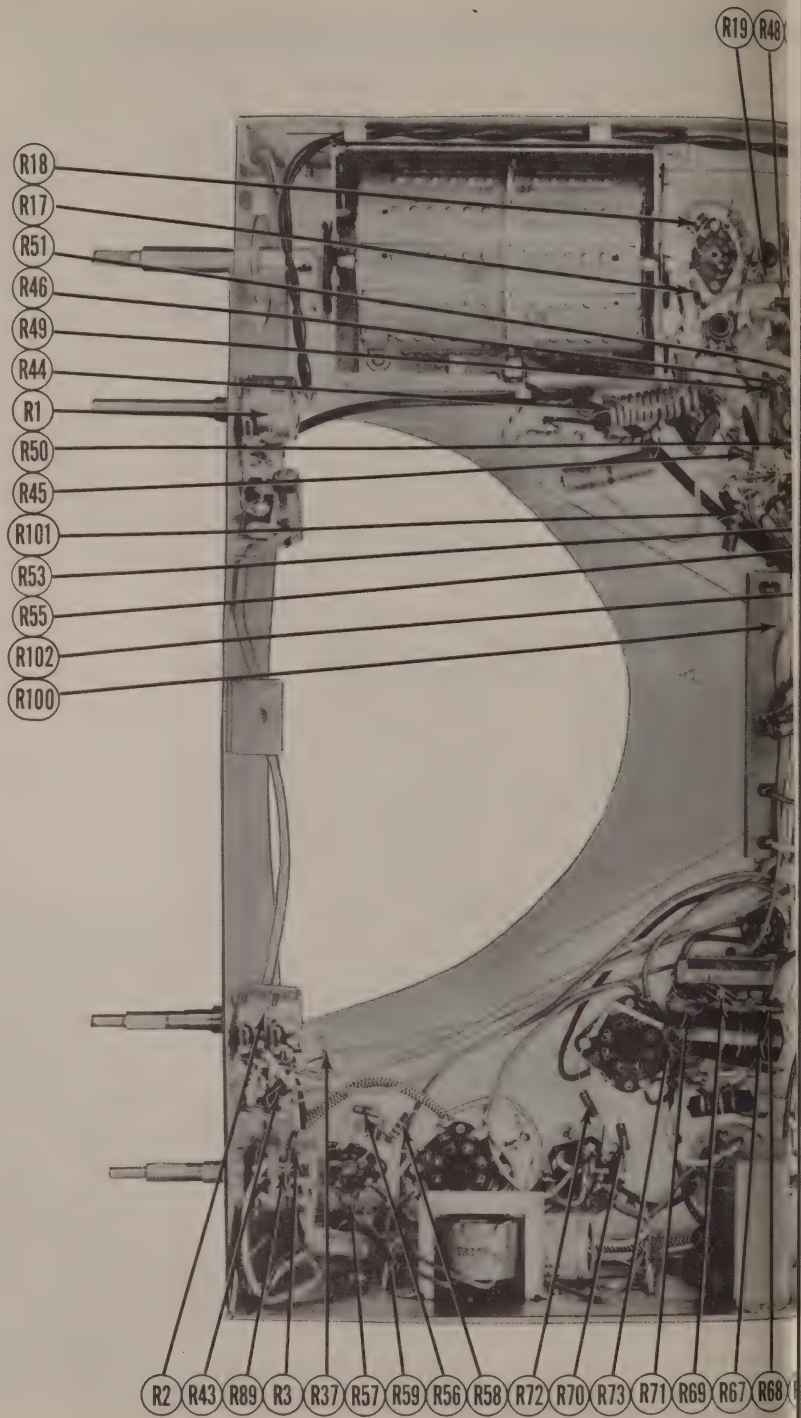


RF TUNER- TOP VIEW

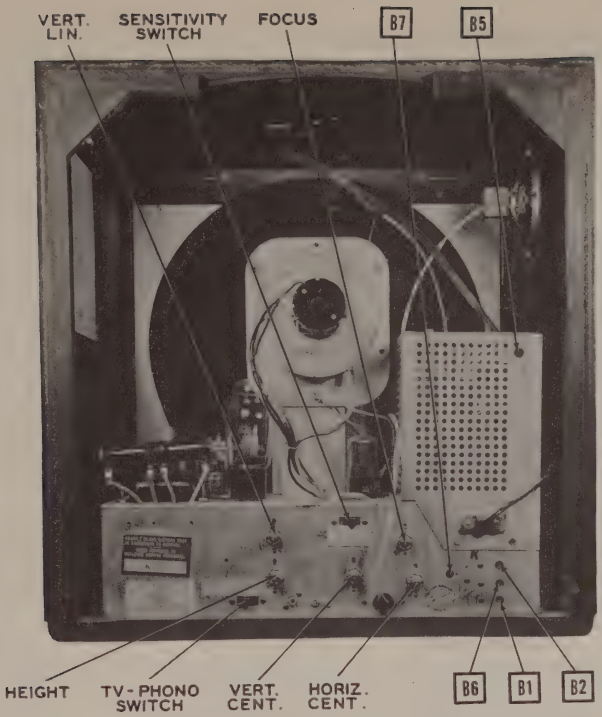


RF TUNER-BOTTOM VIEW

PACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL OSCILLATOR ALIGNMENT CHECK

Tune in a test pattern and turn the horizontal hold control fully clockwise. The picture should remain in synchronization or will slightly shift to the right with the horizontal blanking bars appearing. The blanking bars may move from side to side and will be unstable.

Turn the horizontal hold fully clockwise, the picture should remain in "sync". If the signal is weak, 3 or 4 bars may be seen sloping downward to the left, in which case the receiver is operating normally and will be stable. If the receiver does not function as described, adjustment of the horizontal oscillator will be required.

HORIZONTAL OSCILLATOR ADJUSTMENT (FIELD ADJUSTMENT)

The adjustment of the horizontal oscillator should be made as follows.

1. Turn the horizontal locking range trimmer (B1) 1/2 turn out (counter-clockwise) from the tight position. Turn the horizontal frequency trimmer (B2) 1 turn out (counter-clockwise) from the tight position. Turn the brass adjustment screw (B3) of the horizontal oscillator transformer until it projects about 1/2 inch above the tinnerman speed nut. Turn the horizontal hold control to the mid-position of its range, and the contrast control counter-clockwise for a weak picture.
2. Adjust the horizontal waveform slug (B4) until the picture synchronizes horizontally.
3. While adjusting B4 check the range of the hold control to see that the picture remains in synchronization over the maximum range of the hold control. Turn the contrast control clockwise to normal picture. The picture should remain in synchronization over most of entire range of the hold control. If it does not, a slight adjustment of B1 and B2 may be necessary.

HORIZONTAL OSCILLATOR ADJUSTMENT (SHOP ADJUSTMENT)

Repeat step 1 as in HORIZONTAL OSCILLATOR FIELD ADJUSTMENT.

Connect the low capacity probe of an oscilloscope to terminal "C" of L21. The pattern on the scope should be similar to figure 5. Adjust B4 until the broad and narrow peaks are the same amplitude. It may be necessary to slightly readjust B3 for correct frequency setting since B4 is dependent upon the setting of B3.

Remove the oscilloscope from terminal "C" of and continue with step 3 of the HORIZONTAL OSCILLATOR FIELD ADJUSTMENT outlined above.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS

Some models do not have a width adjustment (B5). If the set has a width adjustment turn it to maximum clockwise (all the way in.) Adjust the horizontal drive trimmer (B6) for maximum brightness without crowding the right side of the picture. Adjust the horizontal linearity slug (B7) for best linearity in the right hold of the picture. Readjust B5 until the picture fills the mask horizontally.

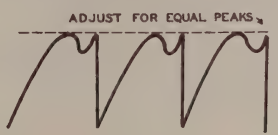


FIG. 5

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: OLYMPIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amp.		6BC5	6BC5	7BD	
B	RF Amp.		6AG5	6AG5	7BD	
V2	Converter		6J6	6J6	7BF	
V3A	1st Video IF		6AG5	6AG5	7BD	
B	1st Video IF		6BC5	6BC5	7BD	
V4A	2nd Video IF		6AG5	6AG5	7BD	
B	2nd Video IF		6BC5	6BC5	7BD	
V5A	3rd Video IF		6AG5	6AG5	7BD	
B	3rd Video IF		6BC5	6BC5	7BD	
V6A	4th Video IF		6AG5	6AG5	7BD	
B	4th Video IF		6BC5	6BC5	7BD	
V7	Video Det. -AGC		6AL5	6AL5	6BT	
V8	Video Amp.		12AU7	12AU7	7BK	
V9	1st Sound IF		6BA6	6BA6	7BK	
V10	2nd Sound IF		6BA6	6BA6	7BK	
V11	Limiter		6AU6	6AU6	7BK	
V12	Disc.		6AL5	6AL5	6BT	
V13	AF Amp. -Sync. Limiter		6AT6	6AT6	7BT	
V14	Audio Output		6K6GT	6K6GT	7S	
V15	Sync. Amp. -Sync. Sep.		6SN7GT	6SN7GT	8BD	
V16A	Vert. Osc.		6C4	6C4	6BG	Used in models DX-619, DX-620, DX-621, DX-622, DX-931, DX-932, DX-950
B	Vert. Osc. -Vert. Amp.		6SN7GT	6SN7GT	8BD	Used in models DX-214, DX-215, DX-216.
V17	Vert. Output		6K6GT	6K6GT	7S	
V18	Hor. AFC-Hor. Osc.		6SN7GT	6SN7GT	8BD	
V19	Hor. Output		6BG6G	6BG6G	5BT	
V20	Damper		6W4GT	6W4GT	4CG	
V21	HV Rect.		1B3GT	1B3GT	3C	
V22	LV Rect.		5U4G	5U4G	5T	
V23A	Picture Tube		16DP4	16DP4	12D	Used in models DX-950, DX-622, DX-621, DX-620, and DX-619.
B	Picture Tube		12LP4	12LP4	12D	Used in models DX-216, DX-215, DX-214.
C	Picture Tube		19FP4	19FP4	12D	Used in models DX-931 and DX-932.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: OLYMPIC PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AFH8J8D26B		UPT445-415V13		TVL-3706	● Filter ■ Filter ▲ Vert. Output Cath.
B	40	150							
C	130	50							
C2A	40	450		AF8J2H		UPT445-135		TVL-2735	● Filter ▲ Filter
B	10	350							
C3A	80	450		AFH162J		UPT8145		TVL-2776	● Filter ▲ Decoupling
B	10	450							
C4A	10	450		AFH2J616G		UP145-340-330		TVL-3782	● Decoupling ■ Filter
B	30	400							
C	30	300							▲ Filter
C5A	250	10		PRS12/250		UPT25-10-1M-6		TVL-2140	■ Hor. Cent. Cont. Byp.† ▲ Vert. Cent. Cont. Byp. †
B	1000	6		PRS6/1000					
C6	24	300		PRS350/24		BR2035A		TVA-1610	Output Decoup.
C7	5			SI5DNPO	TCZ-4.7				Fixed Trimmer
C8	.5-3				829-3				Variable Trimmer
C9	.5-3				829-3				Variable Trimmer
C10	120			GP120K	D6-121				RF Decoupling
C11	1000			GP1000M	D6-102				RF Fil. Byp.
C12	100			SI100KN750	TCN-100				RF Coupling
C13	.5-3				829-3				Variable Trimmer
C14	20			SI20KNPO	TCZ-20				Osc. Grid Cap.
C15	10			SI10DN750	TCN-10				Fixed Trimmer
C16	.5-3				829-3				Variable Trimmer
C17A	1000		BPD-2 x 001	DD-2-102			882-2 x 0015	29C7	RF Bypass
B	1000								Conv. Fil. Bypass
C18	68	500		TCZ-68			NPOM-68		Fixed Trimmer
C19	120	500		1468-00015	D6-121	5W5T15	GP2K-120	1FM-315	IF Coupling
C20	.01	600		P688-01	D6-103	PTE6S1	811-01	TM-11	RF Bypass
C21	1500			GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	Filament Bypass
C22	1500			GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	AGC Filter
C23	1500			GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	1st V. IF Decoup.
C24	330	500		1468-0003	D6-331	5W5T3	GP2K-330	1FM-335	IF Coupling
C25A	1500		BPD-2 x 0015	DD-2-152		1W5D15	882-2 x 0015	29C6	RF Bypass
B	1500					1W5D15			2nd V. IF Decoup.
C26	.22	400		P488-22		GT4P25		TC-2	AGC Filter
C27	1500			GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	AGC Filter
C28	330	500		1468-0003	D6-331	5W5T3	GP2K-330	1FM-335	IF Coupling
C29	1500			GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	3rd V. IF Decoup.
C30	330	500		1468-0003	D6-331	5W5T3	GP2K-330	1FM-335	IF Coupling
C31	47			CN47JNPO	TCZ-47		NPOM-47		Fixed Trimmer
C32	75			CN75JNPO	TCZ-75		NPOM-75		Fixed Trimmer
C33	100	500		1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	4th V. IF Cath.
C34	1500			GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	4th V. IF Screen
C35	1500			GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	4th V. IF Plate Dec.
C36	330	500		1468-0003	D6-331	5W5T3	GP2K-330	1FM-335	IF Coupling
C37	220	500		1468-00025	D6-221	5W5T25	GP2K-220	1FM-325	IF Coupling
C38	1500			GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	AGC Filter
C39	1500			GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	DAGC Dec.
C40	10	500		1468-00001	D6-100	5W5Q1	GP1K-10	MS-41	V. Diode Filter
C41	.05	400		P488-05	DF-503	PTE4S5		TM-15	Video Coupling
C42	.05	400		P488-05	DF-503	PTE4S5		TM-15	Video Coupling
C43	.22	400		P488-22		GT4P25		TC-2	Pic. Tube Cath. Byp.
C44A	1500		BPD-2 x 0015	DD-2-152		1W5D15	882-2 x 0015	29C6	1st S. IF Screen
B	1500					1W5D15			1st S. IF Cath.
C45	1500			GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	1st S. IF Plate Dec.

CAPA

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: OLYMPIC PART No.	REPLACEMENT DATA: AEROVOX PART No.
C46	330	500		1468-0003
C47	1500			GP1500M
C48A	1500			BPD-2 x 0015
B	1500			
C49	330	500		1468-0003
C50	1500			GP1500M
C51	330	500		1468-0003
C52	.002	600		P688-002
C53	.01	600		P688-01
C54	.0022	600		P688-0022
C55	.01	600		P688-01
C56	.0047	600		P688-0047
C57	1500			GP1500M
C58	.05	400		P488-05
C59	220	500		1468-00025
C60	330	500		1468-00035
C61	.002	600		P688-002
C62	.005	600		P688-005
C63	.005	600		P688-005
C64	.0047	600		P688-0047
C65	.05	600		P688-05
C66	.22	400		P488-22
C67	150	500		1468-00015
C68	.0022	600		P688-0022
C69	150	500		1468-00015
C70	.22	400		P488-22
C71	.022	400		P488-022
C72	.05	400		P488-05
C73	180	1000		1469-HV-0002
C74	.01	600		P688-01
C75	.0022	600		P688-0022
C76	390	500		1468-0004
C77	.047	600		P688-047
C78	.22	400		P488-22
C79	.035	600		P688-033
C80	.035	600		P688-033
C81	4	1500		1469-HV-000005
C82	.047	400		P488-047
C83	500	20000		HV20A
C84	.01	600		P688-01
C85	.01	600		P688-01

* Models DX-214, DX-215 and DX-216 use .1MFD in th
† Used only in models DX-619, DX-620, DX-621, DX-
‡ All 19" models use .1/600V in this application.
§ Some models use .1MFD in this application.

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DAT: OLYMPIC PART No.	REPLACEMENT DAT: IRC PART No.
R1A	1 Meg.	½	PT-1477	Q13-137
B	Shaft		Not Req.	Not Req.
C	Switch		Not Req.	76-1
R2A	500KΩ	½		Concentrikit
B	10KΩ	½	PT-1478	B11-133 * B11-116 *
C	Shaft End			E-187 *
R3A	1 Meg.	½		Concentrikit
B	50KΩ	½	PT-1479	B11-137 * B11-123 *
C	Shaft End			E-187 *
R4A	2.5 Meg.	½	PT-1481	Q11-239
B	Shaft		Not Req.	Not Req.
R5	20Ω	2	PT-1482	W20x10
R6	30Ω	2	PT-1483	W-30
R7A	5000Ω	½	PT-1480	Q11-114
B	Shaft		Not Req.	Not Req.
R8	2250Ω	4	PT-1484	

* Additional parts to be used with "Concentrikit".
Note 1. Not used in models DX-214, DX-215, and DX-

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: OLYMPIC PART No.	REPLACEMENT DATA: IRC PART
R9	3900Ω 10%	½		BTS-39
R10	47KΩ 10%	½		
R11	10KΩ 10%	½		
R12	2200Ω	½		BTS-22
R13	10KΩ 10%	½		
R14	4700Ω 10%	½		BTS-47
R15	4700Ω 10%	½		BTS-47
R16	220KΩ	½		
R17	10KΩ	½		
R18	39Ω 10%	½		
R19	1000Ω	½		BTS-10
R20	10KΩ	½		
R21	39Ω 10%	½		
R22	1000Ω	½		BTS-10
R23	1000Ω	½		BTS-10
R24	1 Meg.	½		

DESCRIPTIONS

RS (CONT.)

IT DATA				IDENTIFICATION CODES AND INSTALLATION NOTES
3	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
	5W5T3	GP2K-330	1FM-335	IF Coupling
	1W5D15	GP2L-0015	1FM-215	2nd S. IF Screen
	{1W5D15	882-2 x 0015	29C6	2nd S. IF Plate Dec.
	{1W5D15 }			RF Bypass
	5W5T3	GP2K-330	1FM-335	Limiter Grid Filter
	1W5D15	GP2L-0015	1FM-215	Limiter Decoup.
	5W5T3	GP2K-330	1FM-335	RF Bypass
	PTE6D2	GP2M-002	TM-22	Audio Coupling
	PTE6S1	811-01	TM-11	Audio Coupling
	PTE6D2	GP2M-0022	TM-22	De-emphasis
	PTE6S1	811-01	TM-11	Audio Coupling
	PTE6D5	GP2M-0047	TM-25	Output Plate Byp.
	1W5D15	GP2L-0015	1FM-215	RF Bypass
	PTE4S5		TM-15	Sync. Coupling
	5W5T25	GP2K-220	1FM-325	Sync. Coupling
	5W5T3	GP2K-330	1FM-335	Sync. Sep. Cath. Byp.
	PTE6D2	GP2M-002	TM-22	Integrator Net.
	PTE6D5	811-005	TM-25	Integrator Net.
	PTE6D5	811-005	TM-25	Integrator Net.
	PTE6D5	GP2M-0047	TM-25	Vert. Osc. Grid Cap.
	PTE4S5		TM-15	Vert. Discharge *
	GT4P25		TC-2	Vert. Sweep Coupling
	5W5T15	GP1K-150	1FM-315	Hor. Sync. Coupling
	PTE6D2	GP2M-0022	TM-22	Hor. Sync. Coupling
	5W5T15	GP1K-150	1FM-315	Voltage Divider
	GT4P25		TC-2	AFC Filter
	PTE4S2		TM-12	AFC Filter
	PTE4S5		TM-15	Hor. AFC Plate Byp.
				Hor. Osc. Grid
	PTE6S1	811-01	TM-11	Fixed Trimmer
	PTE6D2	GP2M-0022	TM-22	Hor. Discharge
	5W5T4	GP2K-390	1FM-34	Hor. Sweep Coupling
	PTE6S5		TM-15	Hor. Output Screen
	GT4P25		TC-2	Hor. Output Cath.
				Damper Filter ‡
				Damper Filter
				Hor. Feedback
	PTE4S5		TM-15	Fixed Trimmer †
				HV Filter
	PTE6S1	811-01	TM-11	Line Filter
	PTE6S1	811-01	TM-11	Line Filter

ation.
-931, DX-932, and DX-950.

TROLS

TAT No.	CENTRALAB PART No.	INSTALLATION NOTES
	B-70-S	Volume control
	Not Req.	Attach to R1A per instructions
	Not Req.	Attach to R1A per instructions
		Brightness control-front
	SBB-571	Contrast control-rear
		Attach per instructions in "Concentrikit".
		Vert. hold control-front
	SBB-505	Horiz. hold control-rear
		Attach per instructions in "Concentrikit".
	AN-83	Height control
	AK-1	Attach to R4A per instructions
	SVT-901	Vert. centering control-tapped at 10Ω-See note 1
	V-112	Horiz. centering control-See note 1
	AN-10	Vert. linearity control
	AK-1	Attach to R7A per instructions
	SVP-987	Focus control-Wire Wound

TORS

IDENTIFICATION CODES ALL RESISTORS ARE ± 20% UNLESS OTHERWISE STATED
RF Amp. Grid
AGC Network
RF Amp. Plate
RF Amp. Decoupling
Osc. Grid
Osc. Plate
Conv. Grid Coil Shunt
Conv. Grid Coil Shunt
1st Video IF Amp. Grid
1st Video IF Amp. Cathode
1st Video IF Amp. Decoupling
2nd Video IF Amp. Grid
2nd Video IF Amp. Cathode
2nd Video IF Amp. Decoupling
AGC Network
AGC Network

RESISTORS (CONT.)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	OLYMPIC PART No.	IRC PART No.	
R25	2700Ω 10%	½		BTS-2700	3rd Video IF Amp. Grid
R26	39Ω 10%	½			3rd Video IF Amp. Cathode
R27	2700Ω 10%	½		BTS-2700	3rd Video IF Amp. Plate
R28	1000Ω	½		BTS-1000	3rd Video IF Amp. Decoupling
R29	150Ω	½			4th Video IF Amp. Cathode
R30	5600Ω 10%	½			4th Video IF Amp. Plate
R31	22KΩ	½			4th Video IF Amp. Screen
R32	1000Ω	½		BTS-1000	4th Video IF Amp. Decoupling
R33	1 Meg.	½		BTS-1 Meg.	AGC Diode Load
R34	470KΩ	½		BTS-470K	Voltage Divider
R35	5600Ω 10%	½		BTS-5600	Video Det. Diode Load
R36	1 Meg.	½		BTS-1 Meg.	Video Amp. Grid
R37	3300Ω	½		BTS-3300	Video Amp. Cathode
R38	1 Meg.	½		BTS-1 Meg.	Video Amp. Grid
R39	560Ω 10%	½		BTS-560	Video Amp. Cathode
R40	3900Ω 10%	½		BTS-3900	Video Amp. Plate
R41	3300Ω 10%	1		BTA-3300	Video Amp. Plate
R42	1000Ω	½		BTS-1000	Voltage Divider
R43	100KΩ 10%	½		BTS-100K	Voltage Divider
R44	150Ω	½			1st Sound IF Amp. Cathode
R45	1000Ω	½		BTS-1000	1st Sound IF Amp. Screen
R46	1000Ω	½		BTS-1000	1st Sound IF Amp. Plate Decoupling
R47	22KΩ	½			2nd Sound IF Amp. Grid
R48	150Ω	½			2nd Sound IF Amp. Cathode
R49	1000Ω	½		BTS-1000	2nd Sound IF Amp. Screen
R50	1000Ω	½		BTS-1000	2nd Sound IF Amp. Plate Decoupling
R51	22KΩ	½			Limiter Grid
R52	10KΩ	½			Limiter Decoupling
R53	100KΩ 10%	½		BTS-100K	Disc. Diode Load
R54	100KΩ	½		BTS-100K	Disc. Diode Load
R55	22KΩ	½		BTS-22K	De-emphasis
R56	10 Meg.	½		BTS-10 Meg.	AF Amp. Grid
R57	330KΩ 10%	½		BTS-330K	AF Amp. Plate
R58	470KΩ	½		BTS-470K	Audio Output Grid
R59	1000Ω	1		BTA-1000	Audio Output Decoupling
R60	1 Meg.	½		BTS-1 Meg.	Sync. Amp. Grid
R61	22KΩ	1		BTA-22K	Sync. Amp. Plate
R62	3.9 Meg. 10%	½		BTS-3.9 Meg.	Sync. Sep. Grid
R63	6800Ω	½		BTS-6800	Sync. Sep. Cathode-See Note 2
R64	10KΩ	½		BTS-10K	Integrator
R65	8200Ω 10%	½		BTS-8200	Integrator
R66	8200Ω 10%	½		BTS-8200	Integrator
R67	1 Meg.	½		BTS-1 Meg.	Vert. Osc. Plate
R68	6.8 Meg. 10%	½		BTS-6.8 Meg.	Voltage Divider
R69	100KΩ 10%	½		BTS-100K	Voltage Divider
R70	1 Meg.	½		BTS-1 Meg.	Vert. Osc. Grid
R71	5600Ω 10%	½		BTS-5600	Vert. Peaking-See Note 3
R72	2.2 Meg.	½		BTS-2.2 Meg.	Vert. Output Grid
R73	1000Ω	2		BTS-1000	Vert. Output Cathode-See Note 4
R74	56KΩ	1		BTA-56K	Vert. Transformer Shunt-See Note 5
R75	680Ω	1		BTA-680	Focus Coil Shunt
R76	680Ω	1		BTA-680	Focus Coil Shunt
R77	680Ω	1		BTA-680	Focus Coil Shunt-See Note 6
R78	3.3 Meg. 10%	1		BTA-3.3 Meg.	Voltage Divider
R79	560KΩ 5%	½		BTS-560K-5%	Horiz. AFC Grid
R80	180KΩ 10%	½		BTS-180K	Horiz. AFC Cathode
R81	100KΩ 5%	1		BTA-100K-5%	Horiz. AFC Cathode
R82	8200Ω 10%	½		BTS-8200	Horiz. AFC Filter
R83	150KΩ 10%	½		BTS-150K	Horiz. AFC Filter
R84	100KΩ 5%	1		BTA-100K-5%	Horiz. Osc. Grid
R85	10KΩ 10%	½		BTS-10K	Horiz. Osc. Coil Shunt
R86	22KΩ	2		BTS-22K	Horiz. Osc. Coil Shunt
R87	68KΩ	1		BTA-68K	Horiz. Osc. Plate
R88	270KΩ 10%	1		BTA-270K	Voltage Divider
R89	120KΩ 10%	½		BTS-120K	Voltage Divider
R90	10KΩ	½		BTS-10K	Filter
R91	1 Meg.	½		BTS-1 Meg.	Horiz. Output Grid
R92	47Ω	½			Parasitic Suppressor
R93	100Ω	1		BW-1-100	Horiz. Output Cathode
R94	4700Ω	1		BTA-4700	Horiz. Output Screen
R95	22KΩ	½		BTS-22K	Decoupling
R96	560KΩ 10%	½		BTS-560K	Feedback
R97	3.3Ω 5%	1			HV Rect. Filament-Wire Wound
R98	1 Meg.	2			HV Filter
R99A	1125Ω	20			Filter-Wire Wound
B	610Ω	20			Bias Network-Wire Wound
R100A	100Ω	2		BT-2-100	Bias Network -Wire Wound
B	35Ω	1			Bias Network-Wire Wound
C	8200Ω	5			Bleeder-Wire Wound
R101	3300Ω	1		BTA-3300	Bleeder
R102	330KΩ 10%	½		BTS-330K	Voltage Divider

Note 2. Some models use a 1000Ω resistor in this application.
Note 3. Models DX-214, DX-215, DX-216 use a 3300Ω resistor in this application.
Note 4. Models DX-214, DX-215, DX-216 use a 560Ω resistor in this application
Note 5. Used in models DX-214, DX-215 and DX-216 only.
Note 6. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	OLYMPIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1.9A	700VCT .240ADC	5VAC @ 3A	6.3VAC @ 9.2A SEC. 4 6.3VAC @ .6A	TR-1688	P-8153 P-5014 ①	P-3059	TP-355 ③

① Mount under chassis and use for SEC. #4
③ Drill new mounting holes.

OLYMPIC MODELS DX-214, DX-215, DX-216, DX-619, DX-620, DX-621, DX-622, DX-931, DX-932, DX-950

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA OLYMPIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	185Ω	1000Ω	TR-1473	A-8111 ②	A-3000 ②	TBO-1 ②	Vert. Block Osc. Trans.
T3	400Ω Tap ⓐ 100Ω	13Ω Tap ⓐ .4Ω, 8.8Ω SEC. 2 0Ω	TR-2092-1		HVO-6		Hor. Output Trans.
T4	530Ω	5.5Ω	TR-1343	A-8115	A-3035	TSO-1	Vert. Output Trans.
T5A	14Ω			DY-7	MD-70F		Hor. Deflection Coil
B	65Ω						Vert. Deflection Coil
T6	410Ω		CL-1842-1				Focus Coil

② Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA OLYMPIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	6000Ω	4.3Ω	260Ω	.4Ω	TR-1506	A-8114	A-2931	RO-13 ②	② Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA OLYMPIC PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	PM	4.3Ω	SK-1788		5A07	
	CONE DIA.	V. C. DIA.				
SP2	4 3/4"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∽)	REPLACEMENT DATA OLYMPIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.240ADC	62Ω	2.6 Henries	CK-1346	C-2325 ②	C-2991 ②	TR-3300②	② Drill one new mounting hole.

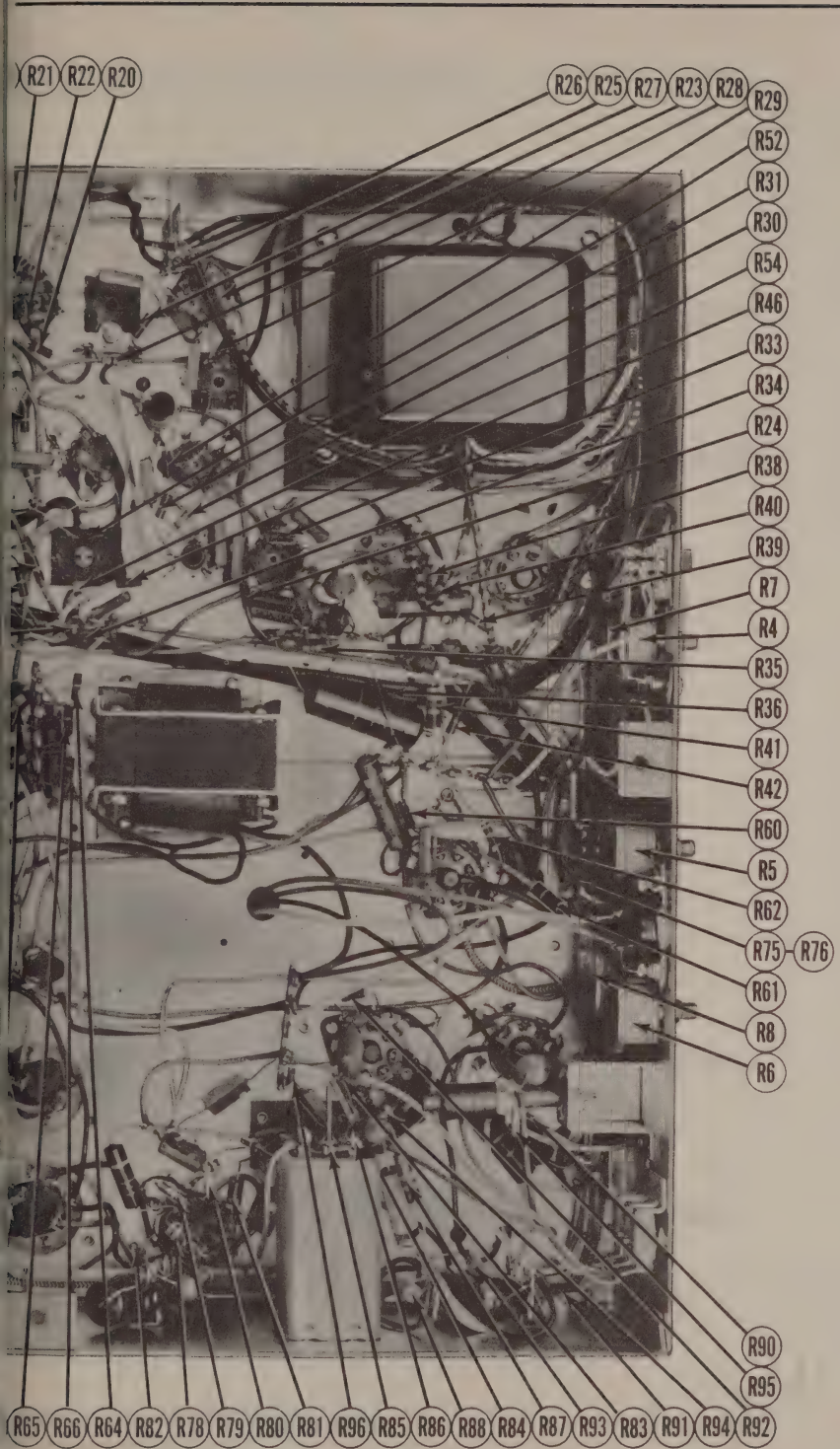
COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA OLYMPIC PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L2	Ant. Coil	0Ω	0Ω			Part of tuner #CL-1677
L3	Fil. Choke	0Ω				Part of tuner #CL-1677
L4	RF, Mixer Grid & Osc.	0Ω				Part of tuner #CL-1677
L5	Fil. Choke	0Ω				Part of tuner #CL-1677
L6	1st Sound IF	1.8Ω	0Ω			Part of tuner #CL-1677
L7	1st Video IF	1.3Ω				Part of tuner #CL-1677
L8	Fil. Choke	0Ω				Not used in models DX-214, DX-215, DX-216
L9	2nd Video IF	.2Ω				
L10	3rd Video IF	.1Ω	.1Ω			
L11	4th Video IF	.2Ω	0Ω			
L12	Sound Trap	.1Ω	0Ω			
L13	5th Video IF	.2Ω				
L14	Peaking	4Ω				Black dot 36 microhenries
L15	Peaking	6.5Ω			19-1921 ①	White dot 180 microhenries wound on 39KΩ res.
L16	Peaking	11.6Ω			19-1922	Green dot 250 microhenries
L17	Peaking	7.4Ω			19-1921 ②	Blue dot 120 microhenries wound on 22KΩ res.
L18	2nd Sound IF	.2Ω				
L19	3rd Sound IF	.1Ω	.1Ω			
L20	Disc. Trans.	.1Ω	.1Ω			
L21	Horiz. Osc.	120Ω	32Ω	TR-1475-1		
L22	Horiz. Lin.	35Ω				
L23	Horiz. Size	.3Ω				

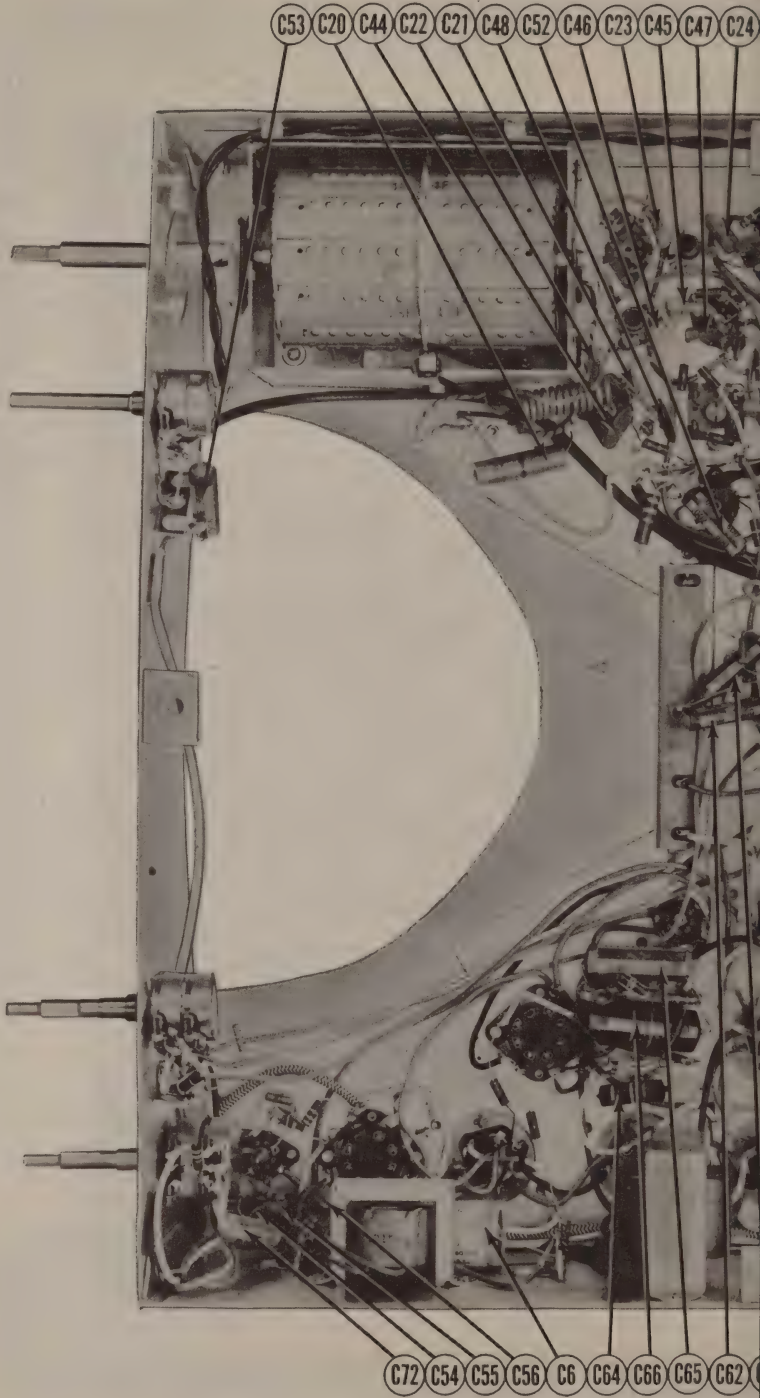
① Parallel with 39KΩ resistor.
② Parallel with 22KΩ resistor.

MISCELLANEOUS

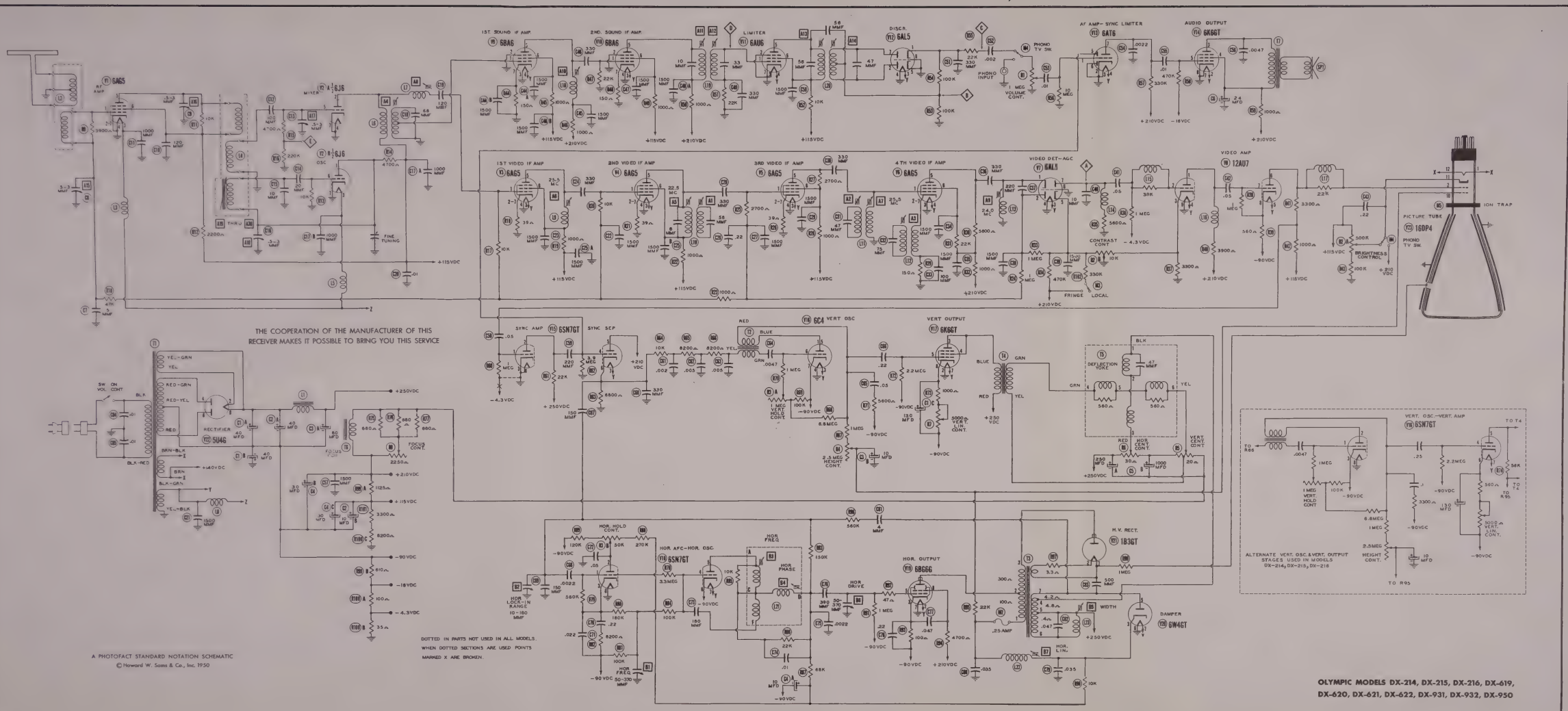
ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M1	RF Tuner	CL-1677	
M2	Fuse		.25A 250V Type 3AG
M3	Switch		Sensitivity
M4	Switch		TV-Phono
M5	Ion Trap		
	Trimmer		3 section. Horiz. drive 50-370MMF, Horiz. freq. 50-370MMF, Horiz. range 10-160MMF



RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-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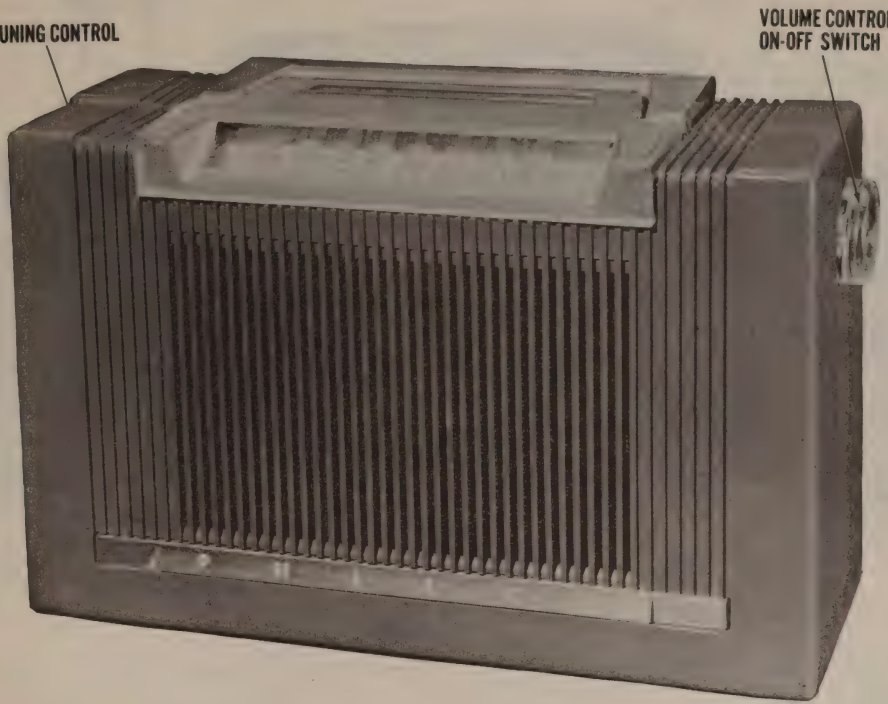
DOTTED IN PARTS NOT USED IN ALL MODELS. WHEN DOTTED SECTIONS ARE USED POINTS MARKED X ARE BROKEN.
ALTERNATE VERT. OSC. & VERT. OUTPUT STAGES USED IN MODELS DX-214, DX-215, DX-216
OLYMPIC MODELS DX-214, DX-215, DX-216, DX-619, DX-620, DX-621, DX-622, DX-931, DX-932, DX-950

OLYMPIC MODELS DX-214, DX-215, DX-216, DX-619, DX-620, DX-621, DX-622, DX-931, DX-932, DX-950

PHILCO MODEL 51-631
(BATTERY-LINE OPERATED)



PHILCO MODEL 51-631
(BATTERY-LINE OPERATED)

PHILCO MODEL 51-631

TRADE NAME	Philco, Model 51-631
MANUFACTURER	Philco Corp., Tioga and "C" Sts., Philadelphia, Pa.
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types 1R5 Converter, 1U4 IF Amp., 1U5 DET-AVC-AF, 3V4 Power Output
POWER SUPPLY	110-120 Volts AC-DC or 1.5 Volts "A" Supply and 67.5 Volts "B" Supply
RATING	.13 Amp. at 117 Volts AC or 250MA at 1.5 Volts DC and 9.5 MA at 67.5 Volts DC
TUNING RANGE—BROADCAST	540-1620KC SHORT WAVE

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer to coincide with first index hole above pointer at low frequency end of dial backplate.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (Grid) of 1R5 (V1). Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1620KC	"	"	A5, A6	Fashion loop of several turns of wire. and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	535KC	Tuning gang fully closed	"	A7	Adjust for maximum output. Repeat steps 2 and 3 until no further improvement can be made.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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PARTS LIST AND DESCRIPTIONS

PHILCO MODEL 51-531

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1U4	1U4	6AR	
V3	DET-AVC-AF	1U5	1U5	6BW	
V4	Power Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150	30-2568-39	E3C261				D13361	■ Filter
B	40	150							▲ Filter
C	10	150							Filter
C2	50	25	30-2417-12	PR825/50		BR255A		TVA-1206	Filament Bypass
C3	.05	200	61-0122	P288-05	DF-503	PTE4S5		TM-15-2	AVC Filter
C4	7.5		30-1224-65						Fixed Trimmer
C5	1.5		30-1221-3	S11.5NPO	TCZ-1.5		NPOK-1.5		Osc. Coupling
C6	47		62-051009001	S147	D6-470	5W5Q5	GP1K-47	19C25	Osc. Grid Cap.
C7A	4000		30-1239	BPD-2x004	DD-2-502	1D5D4	882-2 x 004	36C2	Osc. Anode Dec.
B	4000					1D5D4			IF Grid Filter
C8	.22	100	45-3505-49	P185-25		GT2P25		68P19	Filament Bypass
C9A	1000		30-1237	BPD-001	DD-102		811-001	19C1	Audio Coupling
B	10000			BPD-01	DD-103		811-01	36C1	AF Amp. Screen
C	2000			BPD-002	DD-202		811-002	29C2	Audio Coupling
D	220			1468-00025	D6-221	5W5T25	GP2K-220	19C13	Output Grid Bypass
C10	.004	600	61-0179	P688-004	D6-402	PTE6D4	GP2M-004	TM-24	Output Plate Bypass
C11	.1	400	61-0113	P488-1	DF-104	PTE4P1		72P52	Line Isolation
C12	.047	400	45-3505-45	P488-047	DF-503	PTE4S5		TM-15-4	Line Filter
C13	2.2		30-1221-4		TCZ-2.2				Neutralizing

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	33-5566-21	Q14-137			Volume control
B	Switch		Not Req.	76-2			Attach to R1A per instructions

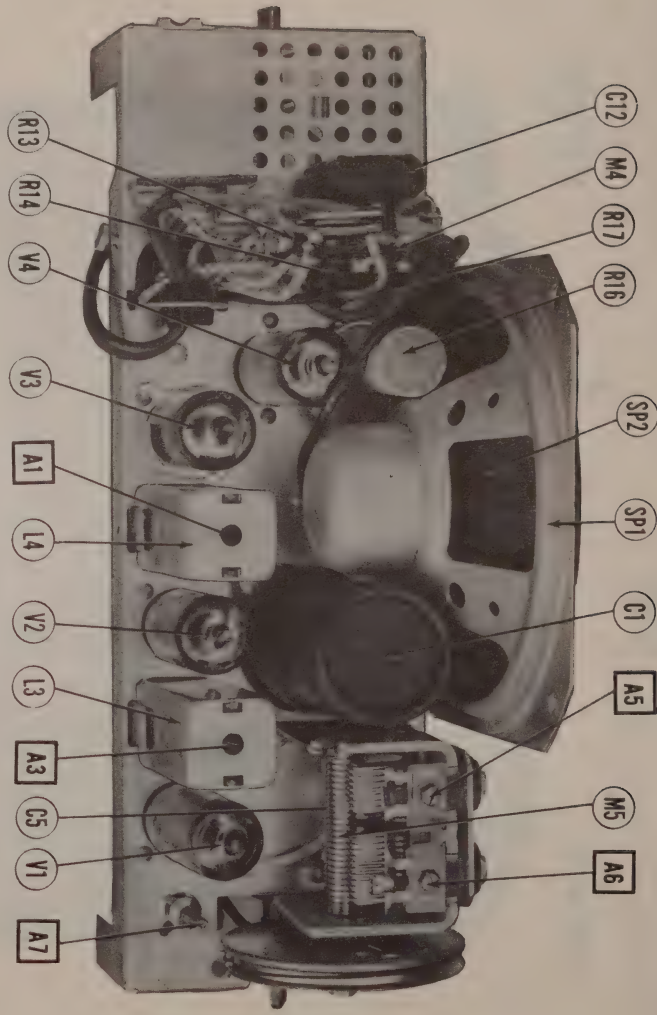
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R2	3.3 Meg.	½	66-5338340	BTS-3.3 Meg.	Conv. Grid
R3	100KΩ	½	66-4108340	BTS-100K	Osc. Grid
R4	680Ω	½	66-1688340	BTS-680	Filament String
R5	22KΩ	½	66-3228340	BTS-22K	Osc. Anode Decoupling
R6	3.3 Meg.	½	66-5338340	BTS-3.3 Meg.	IF Amp. Grid
R7	2.2 Meg.	½	66-5228340	BTS-2.2 Meg.	AVC Network
R8	4.7 Meg.	½	66-5478340	BTS-4.7 Meg.	AF Amp. Grid
R9	4.7 Meg.	½	66-5478340	BTS-4.7 Meg.	AF Amp. Screen
R10	1 Meg.	½	66-5108340	BTS-1 Meg.	AF Amp. Plate
R11	2.2 Meg.	½	66-5228340	BTS-2.2 Meg.	Output Grid
R12	820Ω	½	66-1828340	BTS-820	Filament String
R13	1500Ω	½	66-2158340	BTS-1500	Filament String
R14	330Ω	½	66-1338340	BTS-330	Bias Network-Wire wWound
R15	150KΩ	½	66-4158340	BTS-150K	Isolation
R16A	1050Ω	10	33-3445	1 3/4A-1000	Filter-Wire Wound
B	1050Ω			1 3/4A-1000	Filament Dropping-Wire Wound
R17	820Ω	½	66-1828340	BTS-820	Filter
R18	120Ω	2	33-1334-14	BW-2-120	Surge Limiter-Wire Wound

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	9000Ω	3.4Ω	370Ω	.6Ω	32-8434	A-3329	A-2927 ①		① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA PHILCO PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-113		
SP1	PM	3.4Ω	36-1637	MOD. P4-X	4A07	
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	REPLACEMENT DATA MEISSNER PART No.
L1	Loop Ant.	.1Ω	.8Ω	32-4455	
L2	Osc. Coil	2.7Ω	6.9Ω	32-4453	14-1074
L3	1st IF	24Ω	24Ω	32-4160-4A	16-6668
L4	2nd IF	32Ω	24Ω	32-4454-1A	16-6669 *

* Add capacitor from low end of secondary to ground.

SELENIUM RECTIFIER

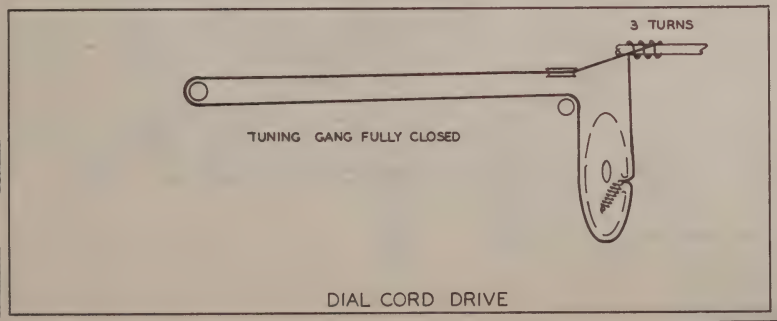
ITEM No.	RATING CURRENT	REPLACEMENT DATA PHILCO PART No.	SYLVANIA PART No.	SELETRON PART No.	NOTES
M1	.065A	34-8003-1	NB-5	5M4	

BATTERIES

ITEM No.	VOLTAGE	PHILCO PART No.	REPLACEMENT DATA EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M2	1.5V "A"		950			2R			2 required
M3	67.5V "B"			467			XX45		

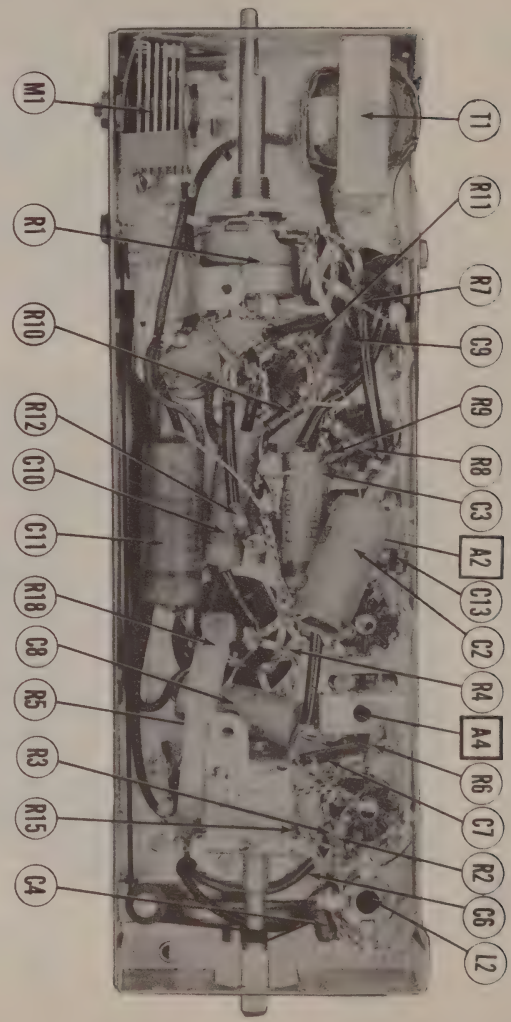
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M4	Switch	42-1925	AC/DC-Battery
M5	2 Gang Var. Cap.	31-2735-2	(22-351MMF, 14-152MMF)
	Cabinet	10799	
	Knob	54-4773	
	Dial Scale	54-5087	
	Dial Pointer	56-7973FCP	

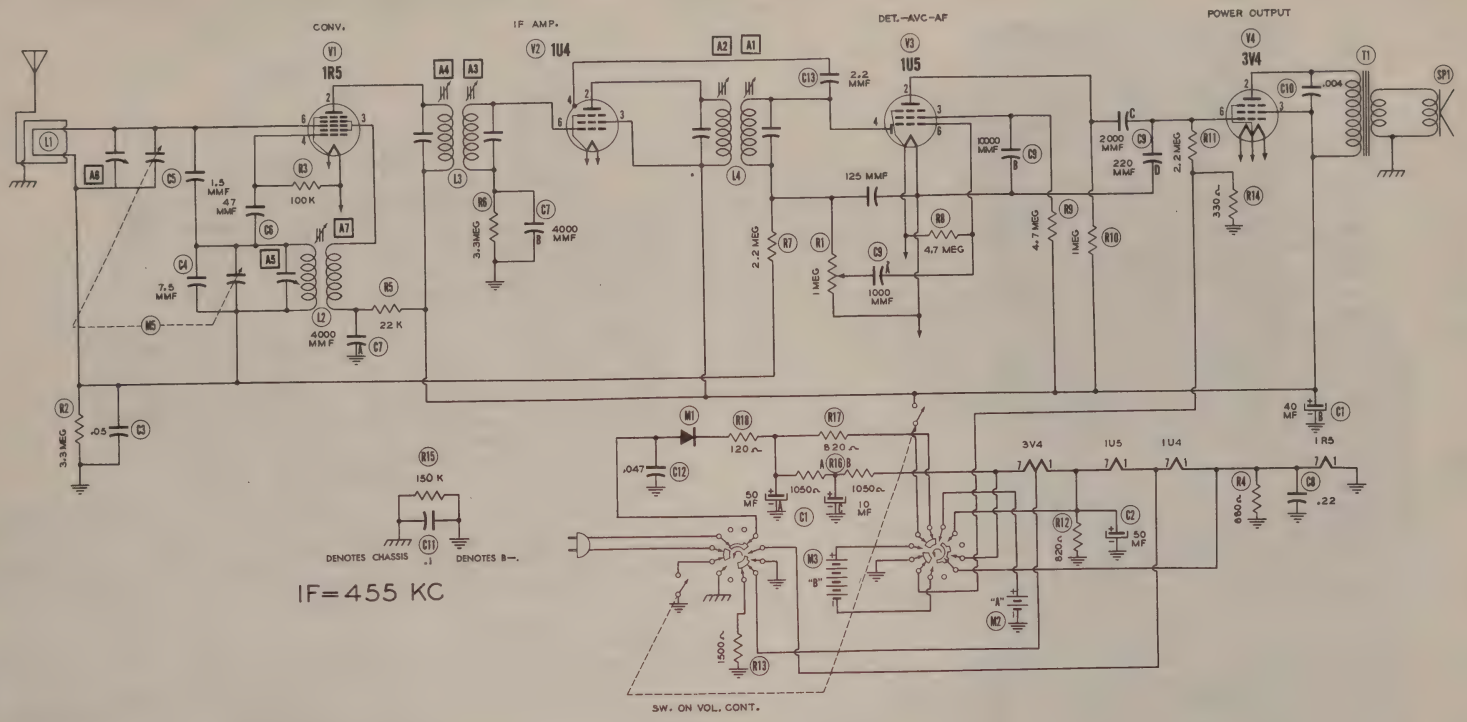


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



PHILCO MODEL 51-631



ON-OFF SWITCH MUST BE "ON" FOR B+ RESISTANCE MEASUREMENTS.
V & R TAKEN IN AC/DC POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0V.	90VDC	42VDC	5-6.8VDC	1.4VDC	.2VDC	1.4VDC
V 2	1U4	1.4VDC	90VDC	90VDC	0V.	1.4VDC	0V.	2.4VDC
V 3	1U5	2.4VDC	18VDC	16VDC	.6VDC	0V.	.2VDC	4VDC
V 4	3V4	4VDC	85VDC	90VDC	0V.	5.2VDC	0V.	6.4VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†940Ω	†23KΩ	100KΩ	*	1.8 Meg.	*
V 2	1U4	*	†940Ω	†940Ω	Inf.	*	3.3 Meg.	*
V 3	1U5	*	†1 Meg.	†4.7 Meg.	1 Meg.	Inf.	4.7 Meg.	*
V 4	3V4	*	†1.3KΩ	†940Ω	0Ω	*	2.2 Meg.	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM OUTPUT OF M1.

THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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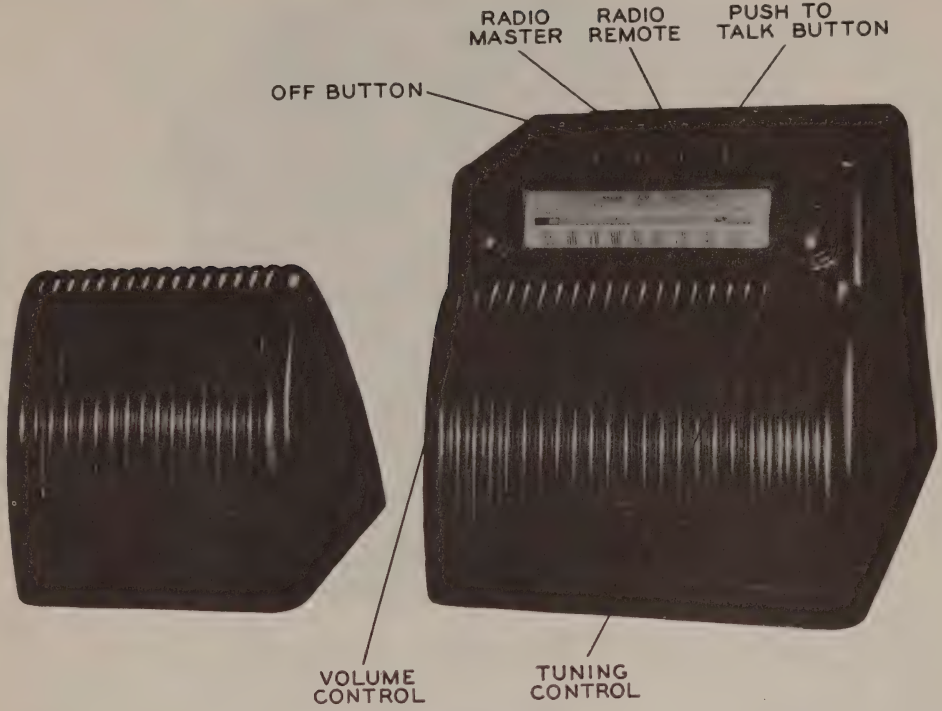
106-12

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



SETCHELL CARLSON
MODEL 458-RD

SETCHELL CARLSON
MODEL 458-RD

SETCHELL CARLSON MODEL 458-RD

TRADE NAME	Setchell Carlson, Model 458-RD
MANUFACTURER	Setchell Carlson Inc., 2233 University Ave., St. Paul 4, Minnesota
TYPE SET	AC-DC Operated Superheterodyne Receiver and Intercommunication System
TUBES (FOUR)	Types 1R5 Converter, 1T4 IF Amp., 1U5 DET-AVC-AF, 3V4 Power Output
POWER SUPPLY	110-120 Volts AC-DC — RATING .20 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer to reference mark at low frequency end of dial backplate. Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

Set pushbutton switch to radio-master position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 6 (Grid) of 1R5 (V1). Low side to B-.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1600KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output.	"	A6	"

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PARTS LIST AND DESCRIPTIONS

SETCHELL CARLSON
MODEL 458-RD

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SETCH. CARL. PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1T4	1T4	6AR	
V3	DET-AVC-AF	1U5	1U5	6BW	
V4	Power Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SETCH. CARL. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	75	150		AF1616D		UP75D15		EL-26	■ Filter
B	75	150							▲ Filter
C2A	75	150		AF1616D		UP75D15		EL-26	■ Filter
B	75	150							▲ Filter
C3	.05	200		P288-05	DF-503	PTE4S5		TM-15-2	AVC Filter
C4	100	500		1468-0001	D6-102	5W5T1	GP1K-100	1FM-31	Osc. Grid Cap.
C5	.25	200		P488-25		GT2P25		TM-2-2	Decoupling
C6	100	500		1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C7	.004	500		P688-004	D6-402	PTE6D4	GP2M-004	TM-24	Audio Coupling
C8	.004	500		P688-004	D6-402	PTE6D4	GP2M-004	TM-24	Audio Coupling
C9	100	500		1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	AF Amp. Plate Byp.
C10	.004	500		P688-004	D6-402	PTE6D4	GP2M-004	TM-24	Output Plate Byp.
C11	.1	400		P488-1	DF-104	PTE4P1		72P52	Line Isolation
C12	.05	1000		P688-05	DF-503	PTE6S5		TM-15	Line Filter
C13	.01	400		P488-01	D6-103	PTE4S1	811-01	TM-11	AF Amp. Screen

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Setch. Carl. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	458R-89	Q13-133	AM-60-Z	B-60	Volume control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions

RESISTORS

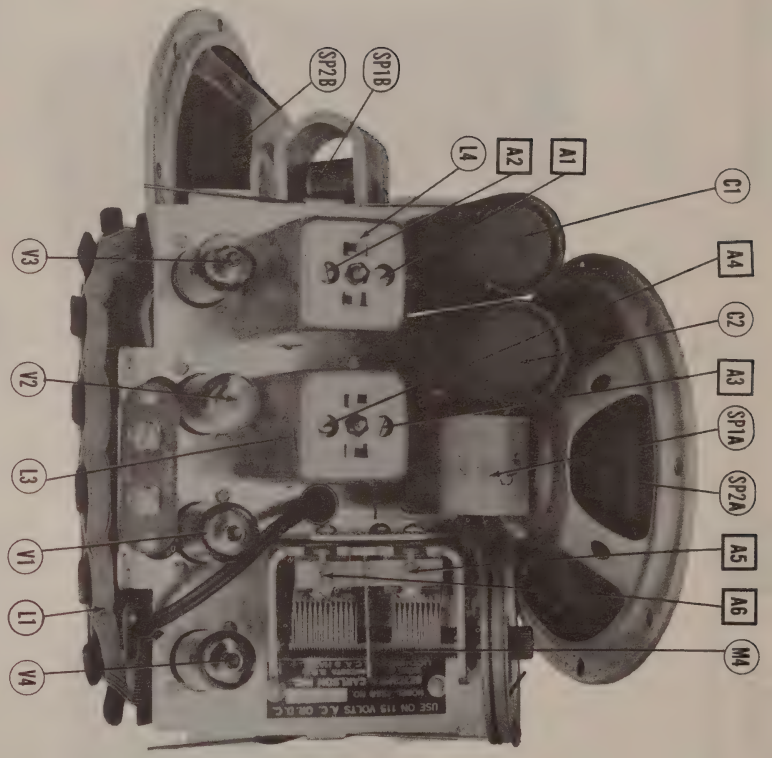
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SETCH. CARL. PART No.	IRC PART No.	IDENTIFICATION CODES
R2	100KΩ	½		BTS-100K	Osc. Grid
R3	5.1 Meg.	½		BTS-4.7 Meg.	AVC Network
R4	5.1 Meg.	½		BTS-4.7 Meg.	AF Grid
R5	5.1 Meg.	½		BTS-4.7 Meg.	AF Screen-See Note 1
R6	510KΩ	½		BTS-470K	AF Plate
R7	100KΩ	½		BTS-100K	Voltage Divider-See Note 2
R8	15Ω	½			Surge Limiter-Wire Wound
R9	2 Meg.	½		BTS-2.2 Meg.	Output Grid
R10	500Ω	5		AB-500	Filter-Wire Wound
R11	2000Ω	10		AB-2000	Filament Dropping-Wire Wound
R12	5100Ω	½		BTS-4700	Filter
R13	24KΩ	½		BTS-22K	Filament String
R14	510Ω	½		BTS-470	Filament String
R15	1200Ω	½		BTS-1200	Filament String
R16	24Ω	½		BW-½-22	Filament Dropping-Wire Wound
R17	100KΩ	½		BTS-100K	Series Neon

Note 1. Some models use a 200KΩ resistor in this application.
Note 2. Not used in all models.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Setch. Carl. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	9500Ω	4Ω	450Ω	.5Ω	0458	A-3879 ①	A-2932 ①	RO-16 ①	① Remount selenium rectifier.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (INPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Setch. Carl. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2			3.9Ω	645Ω	N458				

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD	V. C. IMP.	SETCH. CARL. PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	4Ω		ST-105		
B	PM	4Ω		MOD. P5-X	5A07	
				ST-105		
				MOD. P5-X	5A07	
	CONE DIA.	V. C. DIA.				
SP2A	4 3/4"	9/16"				
B	4 3/4"	9/16"				

R F COILS

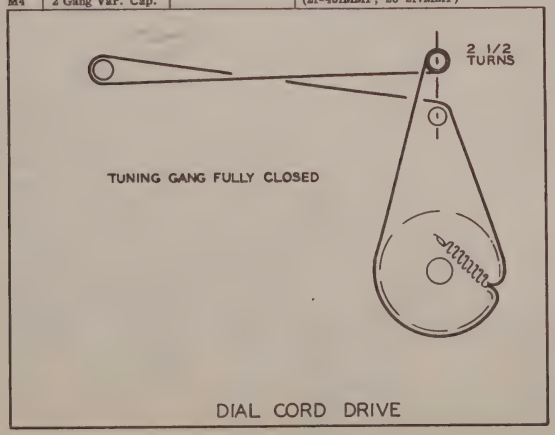
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	SETCH. CARL. PART No.	MEISSNER PART No.	
L1	Loop Ant.	2.6Ω		458R-5		
L2	Osc. Coil	1.3Ω	6Ω		14-1074	
L3	1st IF	19Ω	19Ω	621	16-6668	
L4	2nd IF	19Ω	19Ω	622	16-6669	

SELENIUM RECTIFIER

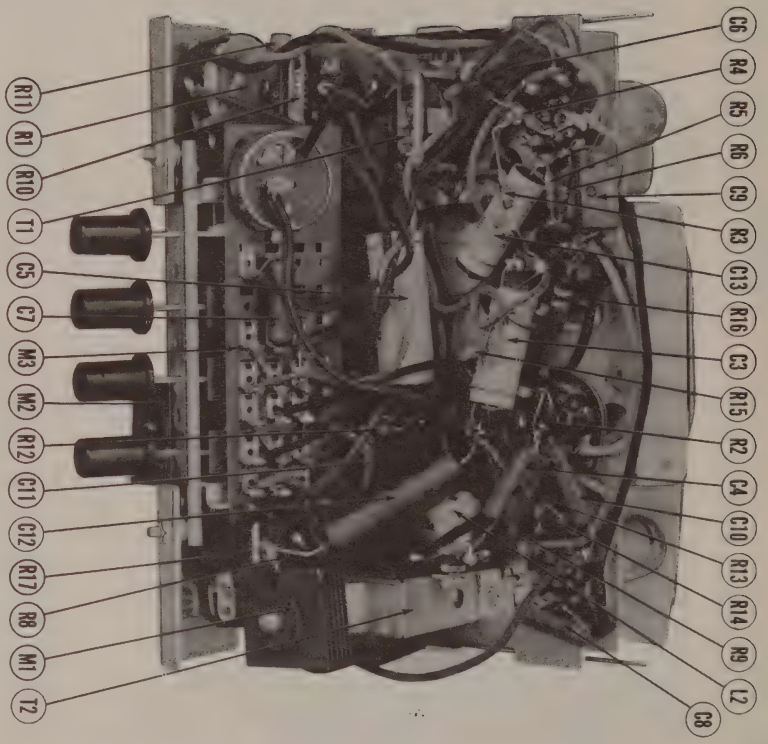
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	SETCH. CARL. PART No.	SYLVANIA PART No.	SELETRON PART. NO.	
M1	.073ADC		NB-5	5M4	

MISCELLANEOUS

ITEM No.	PART NAME	SETCH. CARL. PART No.	NOTES
M2	Neon Lamp		NE2
M3	Switch		Function
M4	2 Gang Var. Cap.		(21-431MMF, 28-217MMF)



CHASSIS—BOTTOM VIEW



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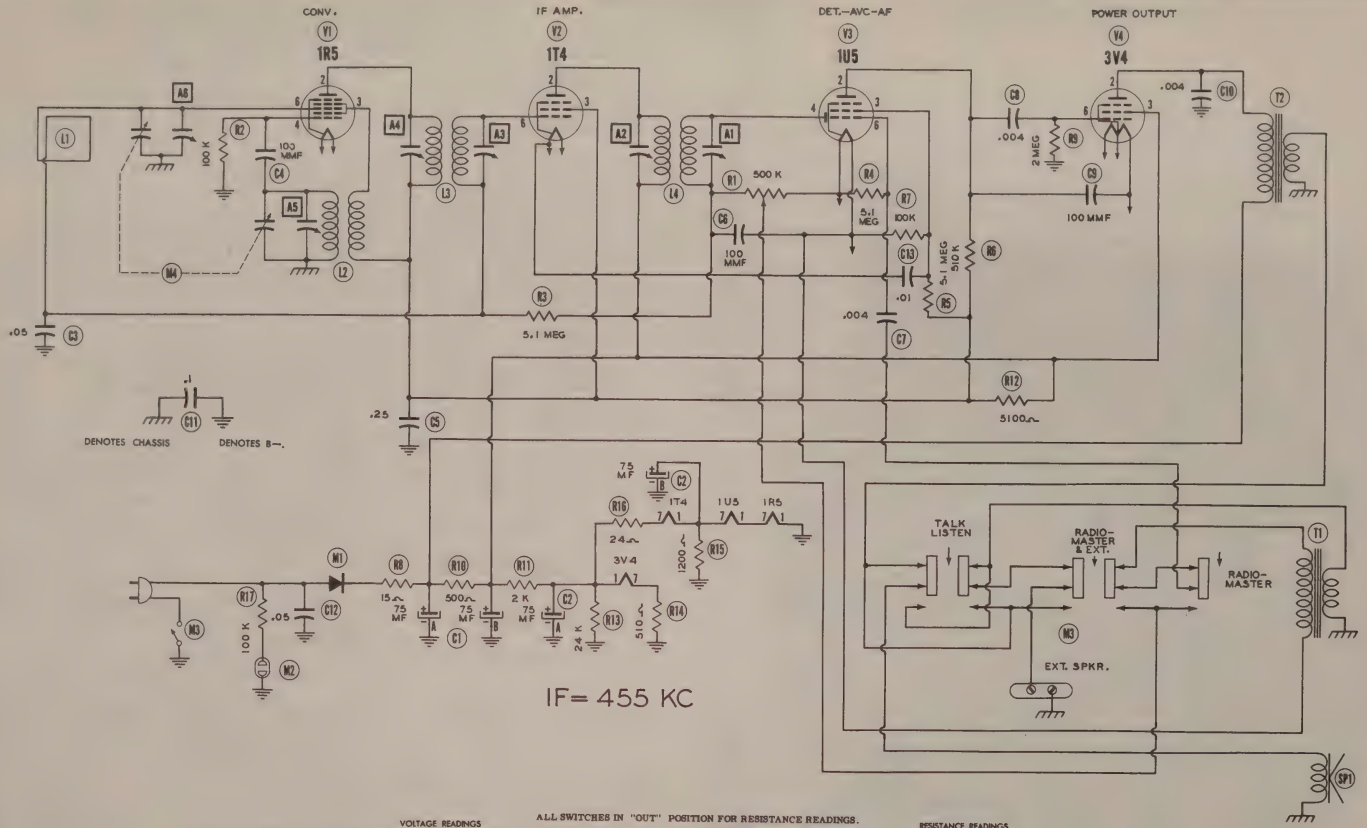
SETCHELL CARLSON MODEL 458-RD

SETCHELL CARLSON MODEL 458-RD



ALL SWITCHES IN "OUT" POSITION FOR RESISTANCE READINGS.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0V.	75VDC	75VDC	8-12VDC	0V.	.1VDC	1.4VDC
V 2	1T4	2.8VDC	105VDC	75VDC	5.2VDC	2.8VDC	.1VDC	4.1VDC
V 3	1U5	1.4VDC	33VDC	12VDC	.5VDC	.5VDC	.1VDC	2.8VDC
V 4	3V4	8VDC	125VDC	105VDC	33VDC	6.7VDC	0V.	5.2VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†5.6KΩ	†5.6KΩ	100KΩ	*	5.5 Meg.	*
V 2	1T4	*	†515Ω	†5.6KΩ	*	*	5.5 Meg.	*
V 3	1U5	*	†515KΩ	†5.1 Meg.	500KΩ	500KΩ	5.1 Meg.	*
V 4	3V4	*	†465Ω	†515Ω	†515KΩ	*	2 Meg.	*

† MEASURED FROM OUTPUT OF M1.
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

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106-13

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3. Measured values are from socket pin to common negative.
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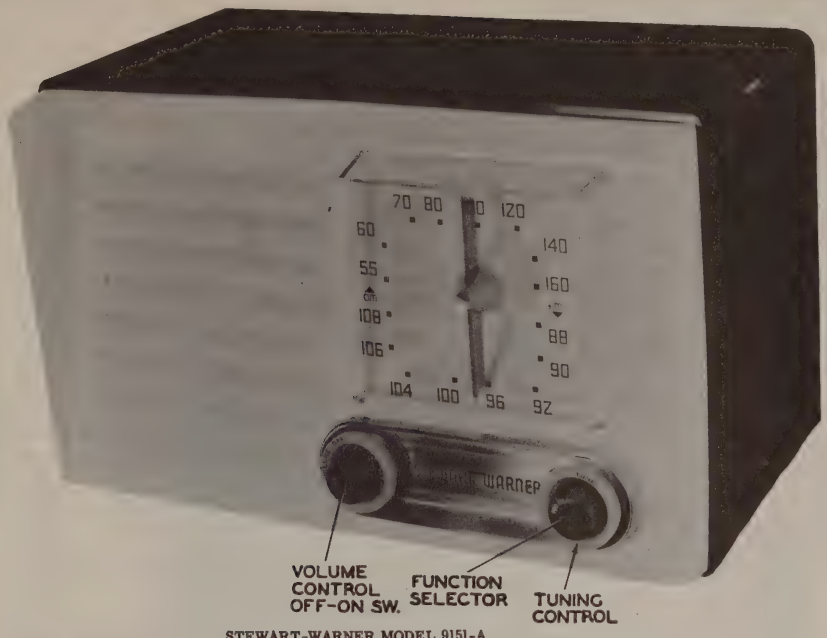
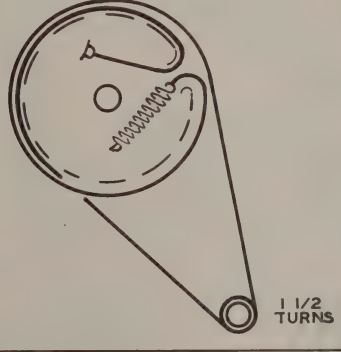
6. Volume control at maximum, no signal applied for voltage measurements.



STEWART-WARNER MODEL 9151-A

TRADE NAME	Stewart-Warner, Model 9151-A		
MANUFACTURER	Stewart-Warner Corp., 1826 Diversey Pkwy., Chicago, Illinois		
TYPE SET	AC-DC Operated AM-FM Superheterodyne Receiver with Loop Antenna		
TUBES (SEVEN)	Types 12AT7 FM RF-Mixer, 12BE6 AM Conv.-FM Osc., 12BA6 1st IF Amp., 12BA6 FM 2nd IF-AM DET-AVC, 12AL5 Ratio Det., 6BH6 AF Amp., 50B5 Power Output		
POWER SUPPLY	110-120 Volts AC-DC	RATING	.33 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1700KC	FREQ. MOD.	88-108MC

TUNING GANG FULLY CLOSED



DIAL CORD DRIVE

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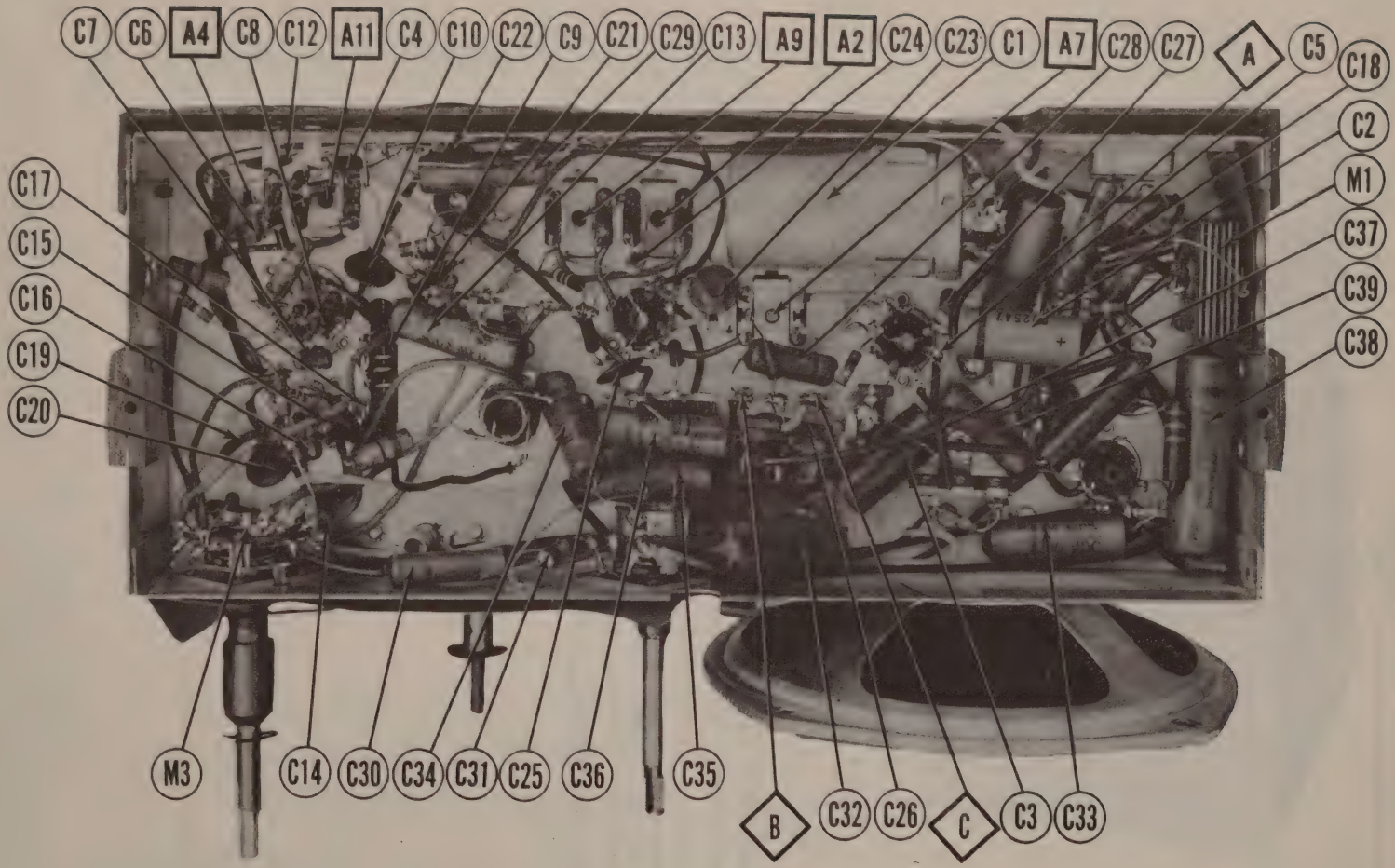
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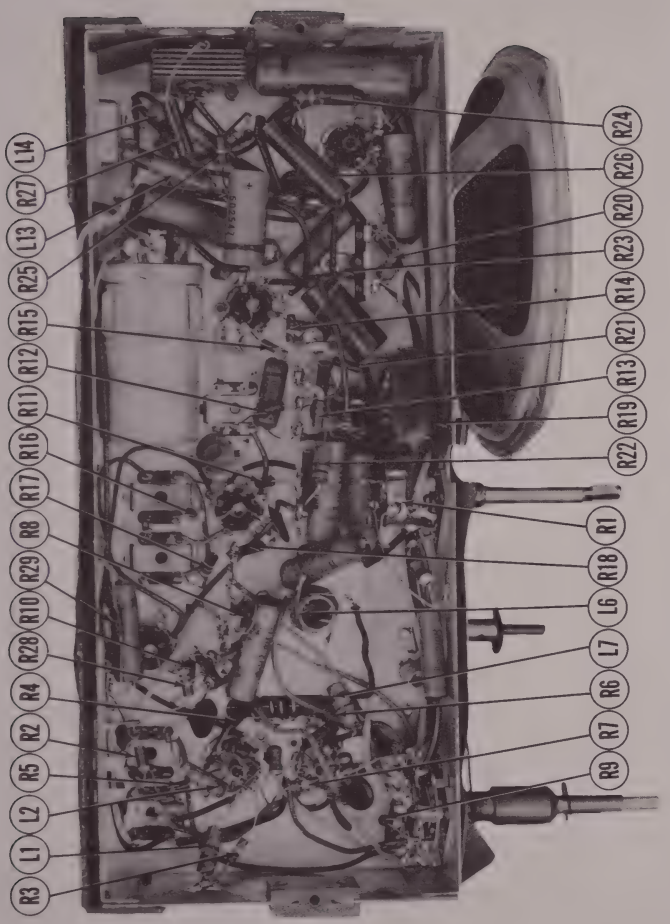

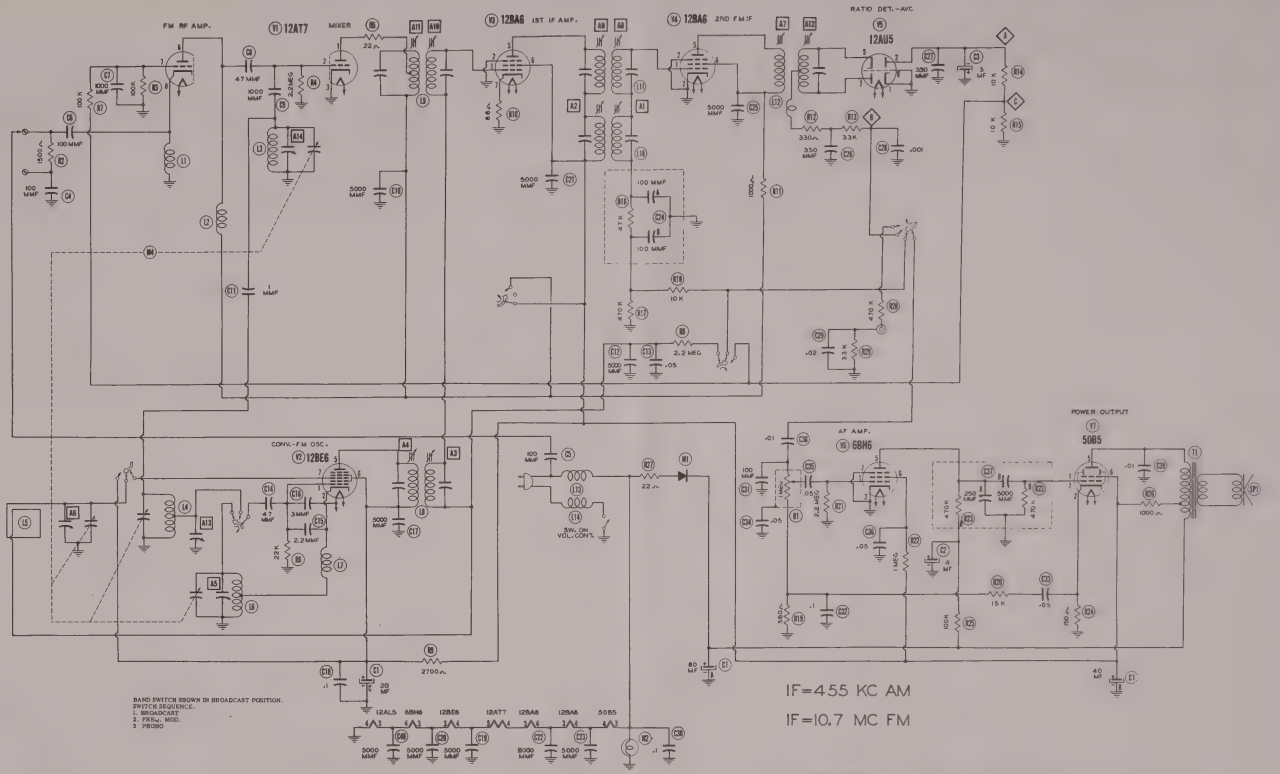

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V1	12AT7	95VDC ‡1.1VDC	-.5VDC	0V	42VAC	265VAC 270VDC	95VDC 110VDC	42VDC 130VDC	0V	265VAC
	V2	12BA6	95VDC ‡6.4VDC	0V	165VAC	265VAC	265VDC ‡85VDC	240VDC #90VDC	4.5VDC #.5VDC		
	V3	12BA6	6.1VDC ‡.4VDC	0V	62VAC	255VAC	260VDC ‡85VDC	235VDC #90VDC	4.5VDC #.5VDC		
	V4	12BA6	‡.5VDC	0V	55VAC	68VAC	‡76VDC #...87VDC	‡75VDC #...89VDC	0V		
†	V5	12AL5	0V	-.7VDC	135VAC	0V	-.69VDC	0V	-.69VDC		
	V6	6BH6	-.45VDC	0V	165VAC	127VAC	260VDC	127VDC	0V		
	V7	50B5	0V	8.4VDC	117VAC	88VAC	236VDC	105VDC	0V		

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V1	12AT7	115000	2.2 Meg.	0Ω	230Ω	350Ω	100000Ω	50KΩ ‡1.7 MEG	80Ω	350Ω
	V2	12BA6	22KΩ ‡2.2Meg.	2.4Ω	180Ω	200Ω	15.7KΩ ‡2.2 Meg.	15.7KΩ ‡2.7 Meg.			
	V3	12BA6	‡2.2Meg.	20Ω	380Ω	470Ω	100000Ω ‡1.2KΩ	100000Ω ‡1.2KΩ	680Ω		
	V4	12BA6	500KΩ	0Ω	470Ω	550Ω	‡.1 Inf.	‡.1 Inf.	0Ω		
†	V5	12AL5	0Ω	90KΩ	12Ω	0Ω	Inf.	0Ω	Inf.		
	V6	6BH6	2.2 Meg.	0Ω	180Ω	12Ω	1470KΩ	51 Meg	0Ω		
	V7	50B5	470KΩ	1560	75Ω	550	13950	100000	470KΩ		

§ TAKEN WITH VACUUM TUBE VOLTMETER.
† TAKEN IN "FM" POSITION.
# TAKEN IN "AM" POSITION
† MEASURED FROM OUTPUT OF MI.

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1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of +- 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

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ITEM No.	USE	REPLACEMENT DATA: STEW. WARN. PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	FM RF Amp.-Mixer	12AT7	12AT7	9A	
V2	FM Osc.-AM Conv.	12BE6	12BE6	7CH	
V3	1st IF Amp.	12BA6	12BA6	7BK	
V4	2nd FM IF Amp.-AM DET-AVC	12BA6	12BA6	7BK	
V5	Ratio Det.	12AL5	12AL5	6BT	
V6	AF Amp.	6BH6	6BH6	7CM	
V7	Power Output	50B5	50B5	7BZ	

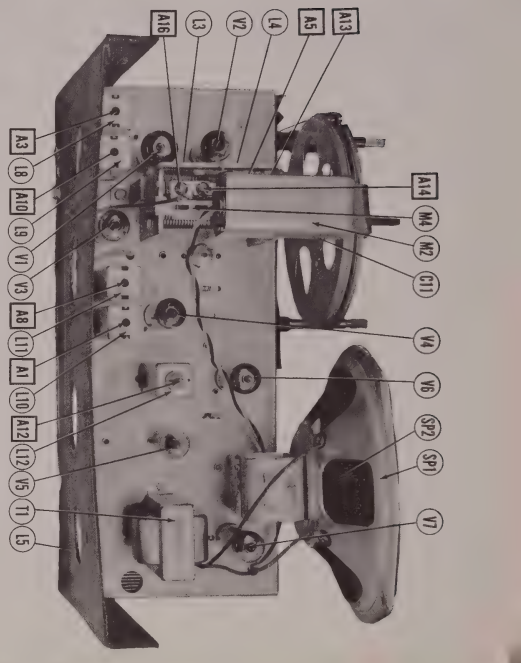
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	STEW. WARN. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	150	507947	AFHI684D		UP444315		TVL-4575	▲ Filter
B	40	150							■ Filter
C	20	150							▲ Decoupling
C2	4	150	502847	PRS150/4		BR415		TVA-1301	Filter
C3	3	50	507946	PRS150/4		BR415		TVA-1303	Stabilizing Cap.
C4	100		513003	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Ant. Isolation
C5	100		513003	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Line Ant. Coupling
C6	100		513003	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	RF Coupling
C7	1000		513009	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	AVC Filter
C8	47		513003	GP47M	D6-470	5W5Q9	GP1K-47	1FM-45	RF Coupling
C9	1000		513009	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	RF Coupling
C10	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C11	1		513000		TCZ-1				Osc. Coupling
C12	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	AVC Filter
C13	.05	200	512027	P288-05	DF-503	PTE485		TM-15-2	AVC Filter
C14	47		513008	GP47M	D6-470	5W5Q9	GP1K-47	1FM-45	Osc. Grid Cap.
C15	2.2		513001		TCZ-2.2				Osc. Feedback
C16	3		513400	S13DN750			N750K-3		Osc. Feedback
C17	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C18	.1	200	513033	P288-1	DF-104	PTE4P1		TM-1-2	RF Bypass
C19	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	Conv. Fil. Bypass
C20	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	Conv. Fil. Bypass
C21	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C22	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	1st IF Fil. Bypass
C23	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	2nd IF Fil. Bypass
C24A	100		506338 *	GP100M	PC-50 *	5W5T1	GP1K-100	1FM-31	Diode RF Filter
B	100			GP100M		5W5T1	GP1K-100	1FM-31	Diode RF Filter
C25	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	2nd IF Decoupling
C26	330		513007	GP330M	D6-331	5W5T3	GP2K-330	1FM-335	Diode Load Cap.
C27	330		513007	GP330M	D6-331	5W5T3	GP2K-330	1FM-335	RF Bypass
C28	.001	600	512001	P688-001	D6-102	PTE6D1	GP2L-001	TM-21	De-emphasis
C29	.02	200	512015	P488-02	DF-203	PTE482		TM-12-2	Phono Isolation
C30	.01	200	512009	P488-01	DF-103	PTE481	811-01	TM-11-4	Audio Coupling
C31	100		513003	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	RF Bypass
C32	.1	200	513033	P288-1	DF-104	PTE4P1		TM-1-2	Tone Comp.
C33	.05	200	512027	P288-05	DF-503	PTE485		TM-15-2	AF Feedback
C34	.05	200	512027	P288-05	DF-503	PTE485		TM-15-2	Vol. Cont. Isolation
C35	.05	200	512027	P288-05	DF-503	PTE485		TM-15-2	Audio Coupling
C36	.05	200	512027	P288-05	DF-503	PTE485		TM-15-2	AF Amp. Screen
C37A	250		505858 †	GP250M		5W5T25	GP2K-250	1FM-325	AF Amp. Plate
B	5000			GP5000M	PC-70 †	PTE6D5	811-005	29C1	Audio Coupling
C38	.1	600	512037	P688-1	DF-104	PTE6P1		TM-1	Line Filter
C39	.01	400	512011	P488-01	D6-103	PTE481	811-01	TM-11-4	Output Plate Bypass
C40	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	Ratio Det. Fil.

* Items C24A, C24B and R16 are combined into one unit.
† Items C37A, C37B, R23A, R23B are combined into one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	STEW. WARN. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	506239	Q13-1ST	AG-61-Z	B8K-70-S	Volume control
B	Shaft		Not Req.	Not Req.	RSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	STEW. WARN. PART No.	IRC PART No.	IDENTIFICATION CODES
R2	1500Ω	½	510139	BTS-1500	FM Antenna Isolation
R3	100KΩ	½	510173	BTS-100K	FM RF Amp. Grid
R4	2.2 Meg.	½	510193	BTS-2.2 Meg.	FM Mixer Grid
R5	22Ω	½	510106		Parasitic Suppressor
R6	22KΩ	½	510161	BTS-22K	FM-AM Osc. Grid
R7	100KΩ	½	510173	BTS-100K	AVC Network
R8	2.2 Meg.	½	510193	BTS-2.2 Meg.	AVC Network
R9	2700Ω	½	510144	BTS-2700	Decoupling
R10	68Ω	½	510116	BW-½-68	1st IF Amp. Cathode
R11	1000Ω	½	510137	BTS-1000	2nd FM IF Amp. Decoupling
R12	330Ω	½	510128	BTS-1330	Balancing
R13	33KΩ	½	510164	BTS-33K	De-emphasis
R14	10KΩ	½	510154	BTS-10K	Ratio Det. Diode Load
R15	10KΩ	½	510154	BTS-10K	Ratio Det. Diode Load
R16	47KΩ	½	506338 *	BTS-47K	Det. Diode Filter
R17	470KΩ	½	510185	BTS-470K	Det. Diode Load
R18	10KΩ	½	510154	BTS-10K	AVC Network
R19	560Ω	½	510132	BTS-560	Feedback
R20	15KΩ	½	510158	BTS-15K	Feedback
R21	2.2 Meg.	½	510193	BTS-2.2 Meg.	AF Amp. Grid
R22	1 Meg.	½	510191	BTS-1 Meg.	AF Amp. Screen
R23A	470KΩ	½	505858 †	BTS-470K	AF Amp. Plate
F	470KΩ	½		BTS-470K	Output Grid
R24	150Ω	1	510232	BTA-150	Output Cathode
R25	100KΩ	½	510173	BTS-100K	AF Amp. Plate Decoupling
R26	1000Ω	2	510237	BTS-1000	Filter
R27	22Ω	1	510207		Surge Limiter
R28	470KΩ	½	510185	BTS-470K	Tone Compensation
R29	33KΩ	½	510164	BTS-33K	Phono Input Shunt

* Items R16, C24A and C24B are combined into one unit.
† Items R23A, R23B, C37A and C37B are combined into one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	STEW. WARN. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2000Ω	5Ω	225Ω Tap ② 10Ω	.5Ω	507937	A-3330	A-3031	RO-3	

SPEAKER

ITEM No.	RATINGS			STEW. WARN. PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.			ST-12 ②		① Use universal mounting bracket provided.
SP1	PM	5Ω		508226	MOD. P6-T	6A15 ①	② Fabricate new mounting bracket.
	CONE DIA.	V. C. DIA.					
SP2	6"	9/16"					

PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: STEW. WARN. PART No.	REPLACEMENT DATA: MEISSNER PART No.	
L1	Cath. Choke	.8Ω		507586		
L2	RF Choke	2.9Ω		507935		
L3	FM RF	0Ω		508224		
L4	FM Osc.	0Ω		508225		
L5	Loop Ant.	3.3Ω		508234		
L6	AM Osc.	6Ω		507939	14-1073	Tap at .6Ω
L7	Cath. Choke	.8Ω		507586		
L8	1st AM IF	20Ω	20Ω	505867	16-6758	
L9	1st FM IF	.5Ω	.8Ω	507943		
L10	2nd AM IF	20Ω	20Ω	505867	16-6758	
L11	2nd FM IF	1.5Ω	.5Ω	505905	16-3487	
L12	Ratio Det. Trans.	3.2Ω	.4Ω	507945		
L13	AC Line Chk.	1.5Ω		507934		
L14	AC Line Chk.	1.5Ω		507934		

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA: STEW. WARN. PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: SELETRON PART No.	NOTES
M1	.059ADC	504972	ND-5	5M4	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: STEW. WARN. PART No.	NOTES
M2	Bayonet	117V			506183	125V 10W

MISCELLANEOUS

ITEM No.	PART NAME	STEW. WARN. PART No.	NOTES
M3	Switch	508231	AM-FM-Phono
M4	2 Gang Var. Cap.	508253	(34-532MMF, 32-242MMF)
A13	Trimmer	507940	FM Osc. Adj.
	Cabinet	508710	
	Dial Scale	508236	
	Dial Pointer	508241	
	Knob	508240	Phono-FM-AM
	Knob	508239	Tuning
	Knob	508238	Volume-Off

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer here tuning cap fully closed and set pointer parallel with base of dial. Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and chassis.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Keep output meter connections short and loose coupling between signal generator and receiver. Signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (Grid) of 6BE6 (VI). Low side to chassis.	455KC (400 ½ Mod.)	AM (CCW)	Tuning gang fully open.	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If unable to obtain adequate output, connect a .001MFD to reduce hum modulation.
2.		Loop	1500KC	"	1500KC	"	A5	Tune for max. output.
3.		Loop	1500KC	"	1500KC	"	A6	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	Disconnect the FM antenna from the FM antenna terminals. High side to pin 7 (Grid) of 12AT7 (V1). Low side to chassis.	10.7MC (Sweep)	FM (1st position CW)	Tuning gang fully open.	DC Probe ⊕ to Point ⊕ Common ⊖ to chassis.	A7, A8, A9, A10, A11.	Adjust for maximum output.
5.	.01MFD	High side to pin 7 (Grid) of 12AT7 (V1). Low side to chassis.	10.7MC (Unmod.)	FM (1st position CW)	Tuning gang fully open.	DC Probe ⊕ to Point ⊕ Common ⊖ to chassis.	A7, A8, A9, A10, A11.	Adjust for zero reading. A positive and negative reading of the meter indicates either side of the circuit is misaligned.
6.	.01MFD	High side to pin 7 (Grid) of 12AT7 (V1). Low side to chassis.	10.7MC (Unmod.)	FM (1st position CW)	Tuning gang fully open.	DC Probe ⊕ to Point ⊕ Common ⊖ to chassis.	A12	Fashion loop of several turns of test lead and couple loosely to receiver. Adjust for maximum output.

FM RF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

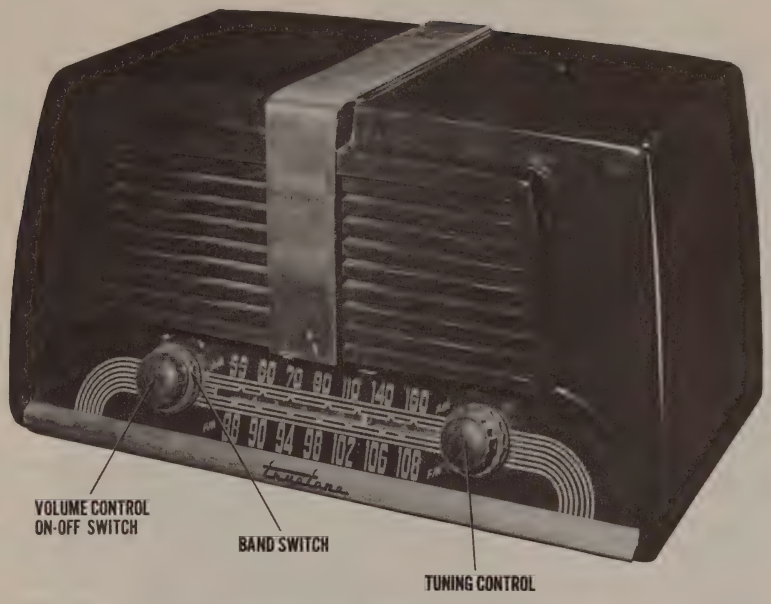
Use 1.5V r. m. s. sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 7 (Grid) of 12AT7 (V1). Low side to chassis.	10.7MC (Sweep)	FM (1st position CW)	Tuning gang fully open.	Vert. Amp. to Point ⊕ Low side to chassis.	A12	Disconnect capacitor C3. Adjust A12 to place 10.7MC at center of crossover lines as per figure 2 and adjust A7 for straightness of crossover lines.

FIG. 1

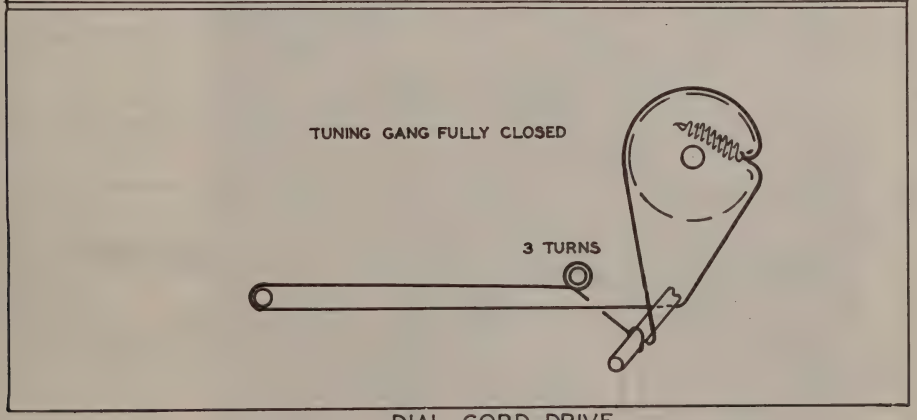
FIG. 2

TRUETONE
MODEL D2020



TRUETONE MODEL D-2020

TRADE NAME	Truetone, Model D-2020 (Fact. Model 223)		
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.		
TYPE SET	AC-DC Operated AM-FM Superheterodyne Receiver with Loop Antenna		
TUBES (EIGHT)	Types 6BJ6 FM RF Amp., 12AT7 FM Converter, 6BE6 AM Converter, 6BJ6 1st IF Amp., 6BA6 2nd IF Amp., 6T8 DET-AVC-AF, 6AS5 Power Output, 6X4 Rectifier		
POWER SUPPLY	105-125 Volts AC-DC	RATING	.34 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1620KC	FREQ. MOD.	88-108MC



DIAL CORD DRIVE

TRUETONE
MODEL D2020

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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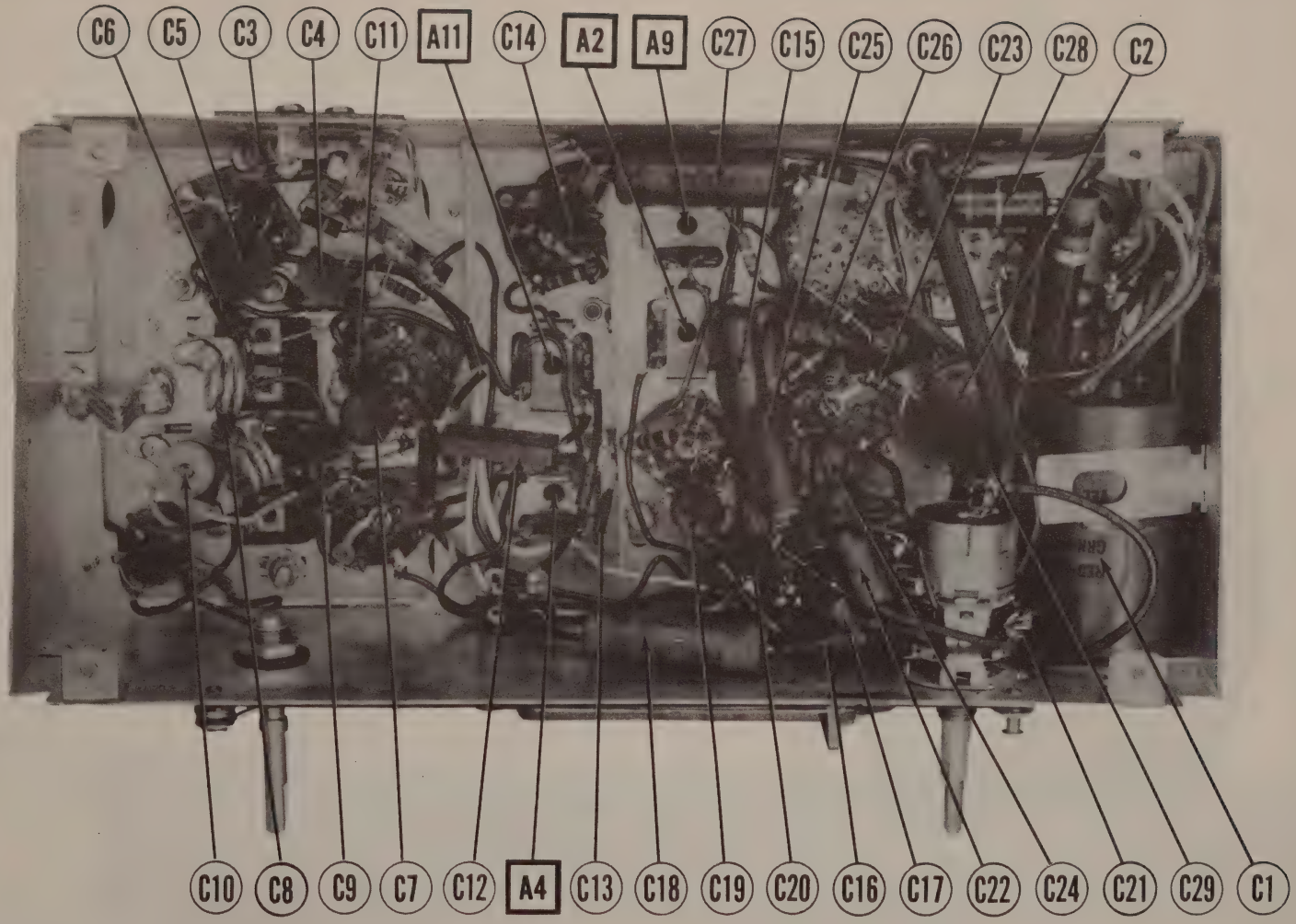
C6
C5
C3
C4
C11
A11
C14
A2
A9
C27
C15
C25
C26
C23
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C10
C8
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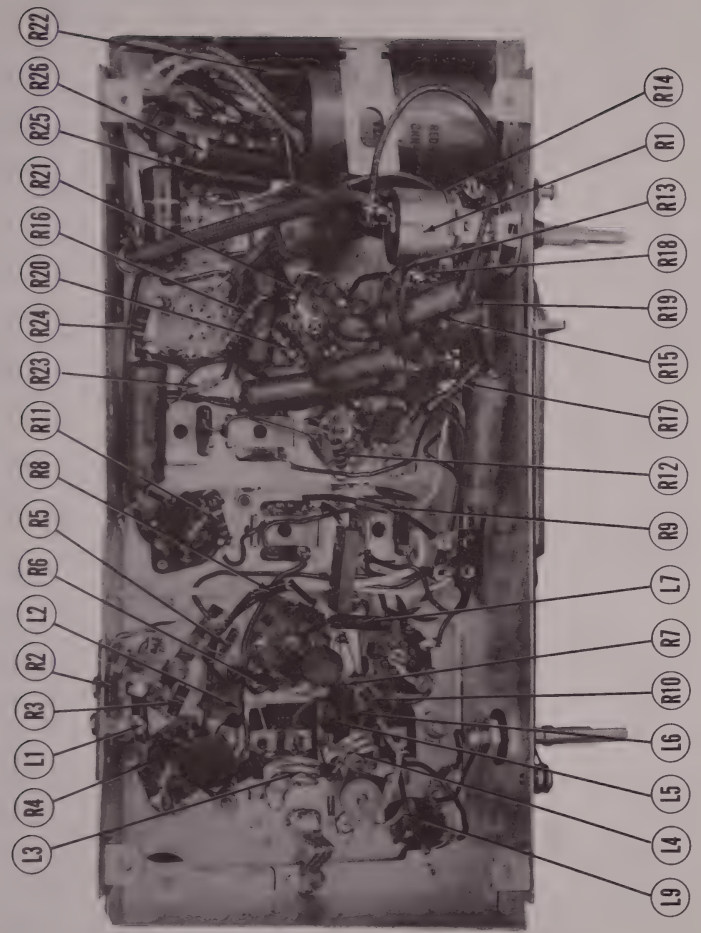
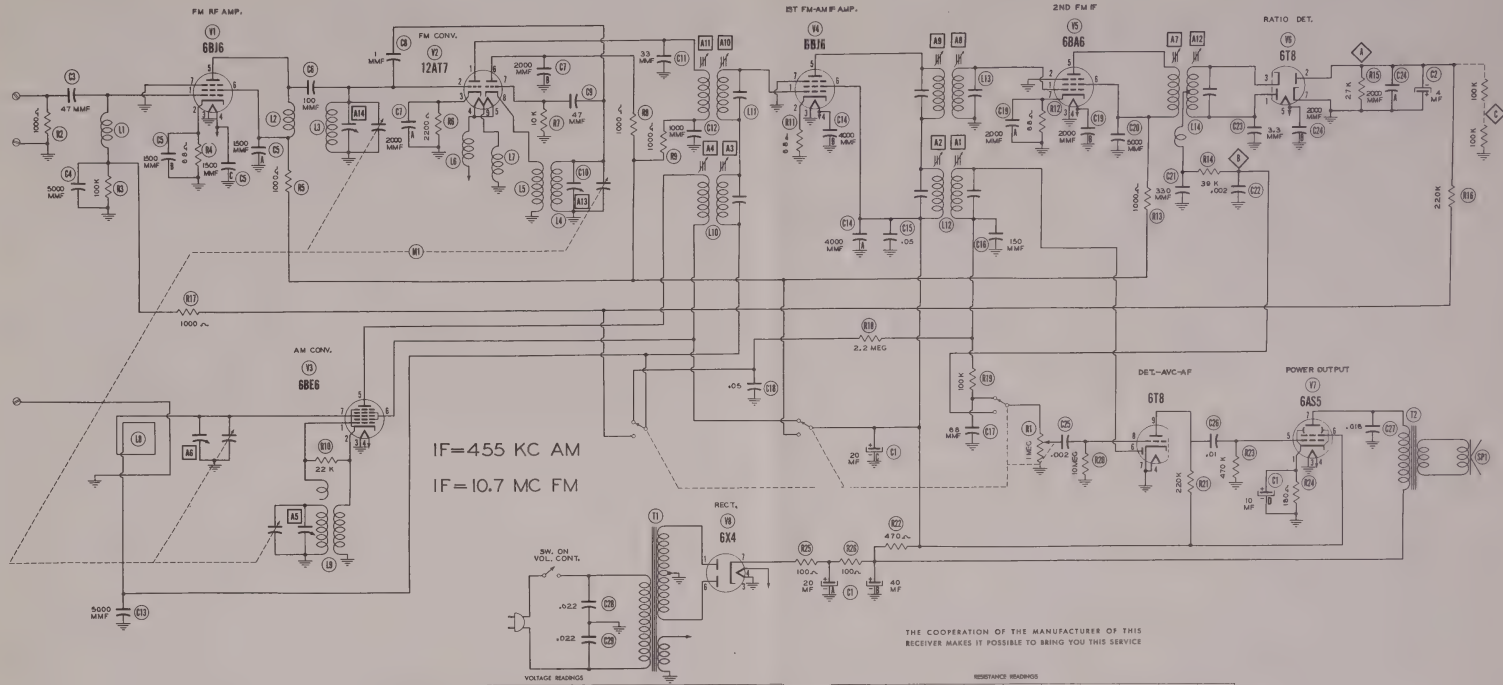
C29
C1





THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
† V1	6BJ6	-.2VDC	.6VDC	0V.	6.3VAC	95VDC	95VDC	0V.		
† V2	12AT7	105VDC	0V.	2VDC	6.3VAC	6.3VAC	105VDC	5-1.4VDC	0V.	0V.
# V3	6BE6	4-7.6VDC	0V.	0V.	6.3VAC	120VDC	120VDC	-.1VDC		
# V4	6BJ6	-.2VDC	.1VDC	0V.	6.3VAC	105VDC	105VDC	0V.		
# V4	6BJ6	-.1VDC	1.2VDC	0V.	6.3VAC	120VDC	120VDC	0V.		
† V5	6BA6	0V.	0V.	0V.	6.3VAC	95VDC	95VDC	.6VDC		
† V6	6T8	-.4VDC	-.5VDC	-.4VDC	0V.	6.3VAC	-.6VDC	0V.	-.4VDC	50VDC
# V6	6T8	0V.	-.6VDC	0V.	0V.	6.3VAC	-.6VDC	0V.	-.4VDC	55VDC
# V7	6AS5	7VDC	.1VDC	0V.	6.3VAC	.1VDC	120VDC	125VDC		
# V8	6X4	155VAC	0V.	0V.	6.3VAC	0V.	155VAC	150VDC		

† TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
† V1	6BJ6	100KΩ	98KΩ	0Ω	1Ω	11.7KΩ	11.7KΩ	0Ω		
† V2	12AT7	11.7KΩ	0Ω	2.3KΩ	4Ω	4Ω	11.7KΩ	10KΩ	2.7Ω	3Ω
# V3	6BE6	22KΩ	.6Ω	0Ω	1Ω	1870Ω	1870Ω	3.3 Meg.		
† V4	6BJ6	55KΩ	88Ω	0Ω	1Ω	1870Ω	1870Ω	0Ω		
# V4	6BJ6	3.3 Meg.	88Ω	0Ω	1Ω	1870Ω	1870Ω	0Ω		
† V5	6BA6	2Ω	0Ω	0Ω	1Ω	11.7KΩ	11.7KΩ	88Ω		
† V6	6T8	1 Meg.	27KΩ	1 Meg.	0Ω	1Ω	Inf.	0Ω	10 Meg.	1220KΩ
# V6	6T8	Inf.	25KΩ	Inf.	0Ω	1Ω	1.1 Meg.	0Ω	10 Meg.	1220KΩ
# V7	6AS5	185Ω	470KΩ	0Ω	1Ω	470KΩ	1870Ω	1490Ω		
# V8	6X4	80Ω	Inf.	0Ω	1Ω	Inf.	75Ω	80KΩ		

† MEASURED FROM PIN 7 OF V6.

† TAKEN IN "FM" POSITION.
# TAKEN IN "AM" POSITION.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer 1 3/8" from center of volume control shaft.

AM ALIGNMENT

Loop should be mounted in same relative position to receiver as in cabinet.
Use non-metallic alignment screwdriver for adjusting.
Set volume control for maximum output reading.
Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO SETTING	OUTPUT METER	ADJUST	REMARKS
6	.05MFD	High side to pin 7 (470 ohms total) Low side to chassis.	455KC (AM CW)	A1 (fully CW)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
5	Loop		1400KC	"	Tuning gang fully open	Across voice coil	A5	Fashion loop of several turns of wire and radiate signal into loop antenna. Adjust for maximum output.
4	Loop		1020KC	"	Tuning gang fully open	Across voice coil	A6	
3	.05MFD	High side to pin 3 (Grid of 12AT7 V2) Low side to chassis.	1020 KC (455KC Sweep)	"	Tuning gang fully open	Across voice coil	A7, A8, A9, A10, A11	Adjust for maximum output.
2	.05MFD	High side to pin 3 (Grid of 12AT7 V2) Low side to chassis.	1020 KC (455KC Sweep)	"	Tuning gang fully open	Across voice coil	A7, A8, A9, A10, A11	Adjust for maximum output.
1	.05MFD	High side to pin 7 (470 ohms total) Low side to chassis.	455KC (AM CW)	A1 (fully CW)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (1%) resistors in series from point A to chassis. The junction of these two resistors is alignment point C as shown on the schematic.

	DUMMY ANTENNA	SIGNAL COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO SETTING	VTVM CONNECT	ADJUST	REMARKS
6	300Ω	Both side thru 300Ω resistors.	98MC (Unmod.)	FM (fully CW)	Tuning gang fully open	DC Probe ⊕ to Point C Common ⊖ to chassis	A12	Adjust for zero reading. A good adjustment can be obtained on either side of the correct setting.
5	"	"	98MC (Unmod.)	"	Tuning gang fully open	Vert. Amp. to Point C Common to chassis	A7, A8, A9, A10, A11	Adjust for maximum output.
4	"	"	108MC (Unmod.)	"	Tuning gang fully open	Vert. Amp. to Point C Common to chassis	A7, A8, A9, A10, A11	Adjust for maximum output.
3	"	"	88MC (Unmod.)	"	Tuning gang fully open	Vert. Amp. to Point C Common to chassis	A7, A8, A9, A10, A11	Adjust for maximum output.
2	"	"	98MC (Unmod.)	"	Tuning gang fully open	Vert. Amp. to Point C Common to chassis	A7, A8, A9, A10, A11	Adjust for maximum output.
1	.05MFD	High side to pin 3 (Grid of 12AT7 V2) Low side to chassis.	98MC (Unmod.)	FM (fully CW)	Tuning gang fully open	Vert. Amp. to Point C Common to chassis	A12	Adjust for maximum output.

FM RF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Use frequency modulated signal with 60 % modulation and 45MC sweep. Use 120 % sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6	300Ω	Both side thru 300Ω resistors.	98MC (Unmod.)	FM (fully CW)	Tuning gang fully open	Vert. Amp. to Point C Common to chassis	A7, A8, A9, A10, A11	Disconnect stabilizer capacitor C2. Adjust for maximum amplitude and symmetry as per figure 11.
5	"	"	108MC (Unmod.)	"	Tuning gang fully open	Vert. Amp. to Point C Common to chassis	A7, A8, A9, A10, A11	Reconnect capacitor C2. Adjust A12 to place 10.7MC at center of response curve as per figure 12. Adjust A7, A8, A9, A10, A11 for maximum amplitude and symmetry of crossover lines.
4	"	"	88MC (Unmod.)	"	Tuning gang fully open	Vert. Amp. to Point C Common to chassis	A12	Adjust for maximum deflection.
3	"	"	98MC (Unmod.)	"	Tuning gang fully open	Vert. Amp. to Point C Common to chassis	A12	Adjust for maximum deflection.
2	"	"	108MC (Unmod.)	"	Tuning gang fully open	Vert. Amp. to Point C Common to chassis	A12	Expand or compress coil turns for maximum deflection. Repeat steps 8 and 9 until no further improvement can be made.
1	.05MFD	High side to pin 3 (Grid of 12AT7 V2) Low side to chassis.	98MC (Unmod.)	FM (fully CW)	Tuning gang fully open	Vert. Amp. to Point C Common to chassis	L3	Adjust for maximum output.

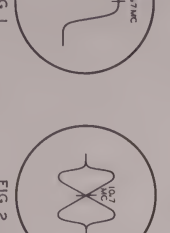


FIG. 1

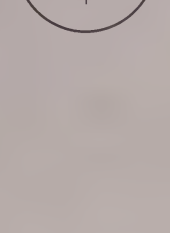


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	FM RF Amp.	6BJ6	6BJ6	7CM	
V2	FM Converter	12AT7	12AT7	9A	
V3	AM Converter	6BE6	6BE6	7CS	
V4	1st FM-AM IF Amp	6BJ6	6BJ6	7CM	
V5	2nd FM IF Amp.	6BA6	6BA6	7BK	
V6	Ratio Det. -DET-AVC-AF	6T8	6T8	9E	
V7	Power Output	6A55	6A55	7CV	
V8	Rectifier	6X4	6X4	8BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	20	200	CE-22	PRS200/30-30		ED1.4225C		EL-334	Filter-Blue
B	40	200		PRS200/16-16		BR2025		TVA-1613	Filter-Green
C	20	200							Filter-Red
D	10	25							Output Cath.-Yellow
C2	4	50	CE-19	PRS150/4		BR550		TVA-13	Stabilizing Cap.
C3	47		CC-047-8	GP47M	D6-470	5W5Q5	GP1K-47	1FM-45	RF Coupling
C4	5000		CC-1-1	BPD-005	DD-502	1D5D5	81L-005	29C1	AVC Filter
C5A	1500		CC-3-0		DD-152	1W5D15	81L-0015	29C3	FM RF Decoupling
B	1500			BPD-3 x 0015	DD-152	1W5D15	81L-0015	29C3	FM RF Cath.
C	1500				DD-152	1W5D15	81L-0015	29C3	FM RF Fil.
C6	100		CC-101-7	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	IF Coupling
C7A	2000		CC-3-1		DD-3-202	1W5D2	882-3 x 002	29C5	FM Mixer Cath.
B	2000			BPD-2 x 002		1W5D2			FM Osc. Plate
C8	1		CBP-1		TCZ-1				Osc. Coupling
C9	47		CC-047-8	GP47M	D6-470	5W5Q5	GP1K-47	1FM-45	Osc. Grid Cap.
C10	5-25		TA-2				557-NPO-5-25		Variable Trimmer
C11	33	500	CMS-033-9		TCZ-33		NPOL-33		Fixed Trimmer
C12	1000	500	CM-102		D6-102	1W5D1	GP2L-001	1FM-21	FM Mixer Dec.
C13	5000		CC-1-1	BPD-005	DD-502	1D5D5	81L-005	29C1	AVC Filter
C14A	4000		CC-3-2		DD-3-502	1D5D4	882-3 x 004	36C2	Decoupling
B	4000			BPD-2 x 004		1D5D4			1st IF Filament
C15	.05	400	CP-503-1	P488-05	DF-503	PTE485		TM-15-4	Decoupling
C16	150	500	CM-151-1	1468-00015	D6-151	5W5T15	GP2K-150	1FM-315	Diode RF Filter
C17	68	500	CC-068-7	1468-000075	D6-680	5W5Q7	GP1K-68	1FM-475	Diode RF Filter
C18	.05	400	CP-503-1	P488-05	DF-503	PTE485		TM-15-4	AVC Filter
C19A	2000		CC-2-1		DD-3-202	1W5D2	882-3 x 004	29C5	2nd IF Cath.
B	2000			BPD-3 x 002		1W5D2			2nd IF Fil.
C20	5000		CC-1-1	BPD-005	DD-502	1D5D5	81L-005	29C1	2nd IF Dec.
C21	330	500	CM-331-8	1468-0003	D6-331	5W5T3	GP2K-330	1FM-335	Diode Load Cap.
C22	.002	400	CP-202-2	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	De-emphasis
C23	3.3		CC-3.3-1	SD.33MPO	TCZ-3.3		NPOK-3.3		Balancing
C24A	2000		CC-2-1		DD-3-202	1W5D2	882-3 x 002	29C5	RF Bypass DET-AVC-AF Fil.
B	2000			BPD-3 x 002		1W5D2			Audio Coupling
C25	.002	400	CP-202-2	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Audio Coupling
C26	.01	400	CP-103-1	P488-01	D6-103	PTE481	81L-01	TM-11-4	Output Plate Byp.
C27	.018	1000	CP-203-20	P1068-02		PTE16B3		MD-13	Line Filter
C28	.022	600	CP-203-1	P688-022	DF-203	PTE6B2		TM-13	Line Filter
C29	.022	600	CP-203-1	P688-022	DF-203	PTE6B2		TM-12	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	Switch		VC-17				Band switch
B	1 Meg.	½					Volume control and on-off switch

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R2	1000Ω	½	RC-102-1	BTS-1000	FM Antenna Isolation
R3	100KΩ	½	RC-104-1	BTS-100K	FM RF Amp. Grid
R4	68Ω	½	RC-680-2		FM RF Amp. Cathode
R5	1000Ω	2	RC-102-1	BTS-1000	FM RF Amp. Decoupling
R6	2200Ω	½	RC-222-2	BTS-2200	FM Conv. Cathode
R7	10KΩ	½	RC-103-2	BTS-10K	FM Osc. Grid
R8	1000Ω	½	RC-102-1	BTS-1000	FM Osc. Plate
R9	1000Ω	½	RC-102-1	BTS-1000	FM Conv. Plate Decoupling
R10	22KΩ	½	RC-223-1	BTS-22K	AM Osc. Grid
R11	68Ω	½	RC-680-2		1st IF Amp. Cathode
R12	68Ω	½	RC-680-2		2nd FM IF Amp. Cathode
R13	1000Ω	1		BTA-1000	2nd FM IF Amp. Decoupling
R14	39KΩ	½	RC-393-2	BTS-39K	De-emphasis
R15	27KΩ	½	RC-273-3	BTS-27K	Ratio Det. Diode Load
R16	220KΩ	½	RC-224-1	BTS-220K	AVC Network
R17	1000Ω	½	RC-102-1	BTS-1000	AVC Network
R18	2.2 Meg.	½	RC-225-1	BTS-2.2 Meg.	AVC Network
R19	100KΩ	½	RC-104-1	BTS-100K	Diode Filter
R20	10 Meg.	½	RC-106-1	BTS-10 Meg.	AF Amp. Grid
R21	220KΩ	½	RC-224-1	BTS-220K	AF Amp. Plate
R22	470Ω	2	RW-471-8	BW-2-470	Filter-Wire Wound
R23	470KΩ	½	RC-474-1	BTS-470	Output Grid
R24	180Ω	½	RC-181-2	BW-½-180	Output Cathode
R25	100Ω	2	RW-101-8	BW-2-100	Surge Limiter-Wire Wound
R26	100Ω	2	RW-101-8	BW-2-100	Filter-Wire Wound

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC ④ .34A	280VCT .048ADC	6.3VAC ④ 3.2A		TR-21	PC-8419 ③ ④	P-3154	

③ Drill new mounting holes.
④ Add series resistor to reduce plate voltage.

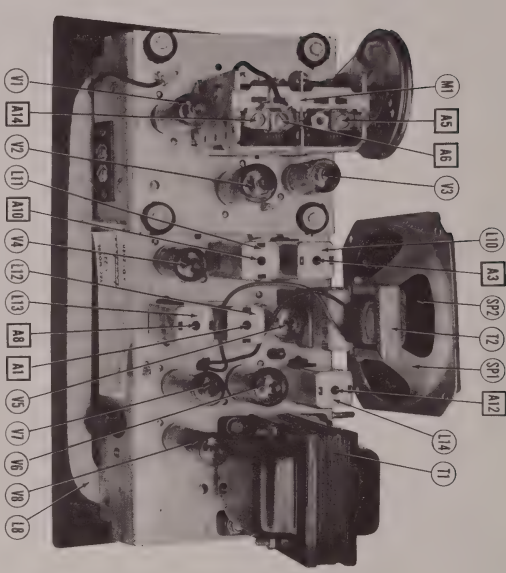
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T2	3300Ω	3.5Ω	200Ω	.5Ω	Part of SP1	A-3333 ①	A-3025 ①	RO-301 ①	① Bend mounting tabs down and remount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-113		
SP1	PM	3.5Ω	SP41-10B	MOD. P4-X	4A07 ②	② Remount output transformer
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: MEISSNER PART No.
L1	RF Choke	.1Ω		LC-15	
L2	RF Choke	0Ω		LC-14	
L3	FM RF	0Ω		LC-12	
L4	FM Osc.	0Ω		LC-11	
L5	RF Choke	2.7Ω		LC-16	
L6	Fil. Choke	.3Ω		LC-13	
L7	Fil. Choke	.3Ω		LC-13	
L8	Loop Ant.	.3Ω	4Ω	LP-19	
L9	AM Osc.	.6Ω	5.3Ω	LC-9	14-1073
L10	1st AM IF	17Ω	17Ω	LF-32	16-6758
L11	1st FM IF	.8Ω	.6Ω	LF-30	16-3487
L12	2nd AM IF	12Ω	12Ω	LF-35	16-6758
L13	2nd FM IF	.7Ω	.7Ω	LF-34	16-3487
L14	Ratio Det. Trans.	1.7Ω	.9Ω	LF-33A	

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M1	2 Gang Var. Cap.	CV-17	(18-405MMF, 23-191MMF)
	Cabinet	CB-121	
	Dial Pointer	PN-17	
	Knob	KN-28-1	Assembly
	Knob	KN-26-1	Large
	Knob	KN-27-1	Small

SCL 106
FOLDER 15

WEBSTER-CHICAGO
MODEL 356

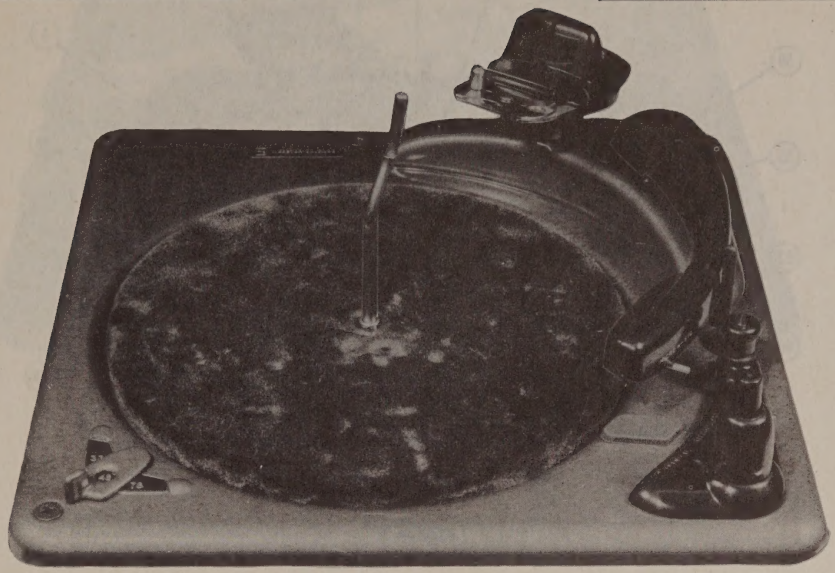


Figure 1

GENERAL INFORMATION

The Webster-Chicago Model 356 is a three-speed, single-post changer designed to play automatically up to a 1-inch stack of 7-inch, 10-inch or 12-inch records at speeds of 33-1/3, 45 or 78 RPM. The pickup arm will return to its rest position after completing the last 10-inch or 12-inch record. The turntable will continue to rotate until the speed-selector lever is moved to the nearest "Off" position. The idler wheel is also pulled away from the motor shaft when the speed-control lever is in an "Off" position, eliminating the possibility of a flat spot developing on the rubber wheel.

The last 7-inch record of a stack continues to play until the speed selector lever is moved to one of the "Off" positions and the pickup arm placed on the arm rest.

A record may be rejected at any time, while playing, by pressing the "Reject Button."

Manual operation is provided for playing "non-standard," "home recording," or "inside-out" records.

The motor is designed to operate on 105-120 volts, 60 Cycles, AC only. If it is desired to operate the changer on 50 Cycle current, a special motor sleeve must be used in order to drive the turntable at the required speed.

Manufactured by:

Webster-Chicago Corporation
5610 Bloomingdale Avenue
Chicago 39, Illinois

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HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

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Automatic trip Clutch Friction -

The clutch collar (83) supplies enough weight (friction) to operate the trip mechanism (items 83, 84, 85, and 88). No oil or grease should be used on the clutch mechanism as this may prevent the clutch mechanism from operating properly. However, if foreign material, oil or grease, comes in contact with these parts, clean them with carbon tetrachloride.

Record-Selector Post Distance -

At the beginning of the change cycle, the record-selector post (17) moves toward the spindle, about 3/32". This position is maintained until the pickup arm has made its full outward swing, at which time the record-selector post again moves toward the spindle, causing the bottom record to drop into playing position. The purpose of this first forward movement is to lock the automatic arm-rest lever (80) so that it will not interfere with the set-down on the last record. The movement of the record-selector post (17) should not be enough to drop a record. If the record does drop during this movement, it will fall on the pickup arm. Early dropping will usually be caused by the selector-post resting too far from the spindle. This allows the record to catch on the edge of the selector post instead of sliding on the ledge, and the initial movement of the post will drop the record.

To properly adjust the record-selector post (17), the rocker arm assembly (77) must be adjusted. To correct the selector post, proceed in the following manner:

1. With the changer out of cycle, remove the spindle and turntable. Before the spindle can be pulled up, the retaining pin (91), Figure 5, must be removed. After turntable has been removed, replace the spindle.

2. Rotate the record-selector post (17) to the 12-inch position and place a 12-inch record on the spindle and record shelf.

3. Insert a screwdriver through the motorboard opening (AA), Figure 2, and turn screw (71), Figure 4. A clockwise rotation of the screw will increase the distance between the spindle and selector post; counterclockwise rotation will decrease it.

It is recommended that the distance between the edge of the record and the step of the record-selector post (17) be held to just 1/32 of an inch, so that the records with rough or sharply beveled edges will not catch on the outer edge of the record-selector post.

Failure to Trip -

1. Manual trip lever (44) binding.

2. Velocity trip and roller assembly (65) binding.

3. Trip dog on main cam (69) binding.

4. Automatic trip arm (84) bent - therefore, not contacting the velocity trip and roller assembly (65).

5. Turn-down tab on velocity trip (65) bent up, resulting in trip arm (84) passing under the trip (65).

6. Trip spring on trip lever (44) bent or broken.

7. No velocity lead-in groove or eccentric groove in the center of record.

Continuous Tripping -

1. Manual trip lever (44) binding.

2. Roller on velocity trip assembly (65) broken.

3. Too much clearance on hook (A) of trip (65).

(a) This hook should be adjusted for about 1/64-inch clearance from the bottom of the main gear (64). Too much clearance may permit the cam pawl to bounce past the hook and re-engage, causing the mechanism to continue to cycle.

(b) If the clearance between the lip (B) on velocity trip lever (65) and the edge of the main cam (69) is too small, it will prevent the hook end (A) of the velocity trip lever from engaging the trigger. Adjust the clearance between the lip (B) and the main cam (69) to be within 1/64" when the roller is contacting one of the protrusions on the actuating gear (64).

Pickup Arm Fails to Return to Rest Post After Last Record -

1. Check the spindle (13) to be sure it moves up and down freely.

2. Hook (D), on automatic arm-rest lever (80), fails to engage the raising disc.

(a) With no record on the spindle, check the automatic shut-off lock lever (80). Hook (D) of lock lever (80) should catch the pickup arm raising disc (88) at the beginning of the change cycle. This causes the pickup arm to sit down on the arm rest (34). With no records on the spindle, with the changer out of cycle, the hook end (D) of lever (80) should clear the top of the pickup arm raising disc (88) by 1/32". Adjust, if necessary, by bending lip (D) of the sub-plate assembly (93). Never attempt to move the pickup arm raising disc (88) up or down.

3. The elevated hook "E" on the automatic shut-off lock lever (80) (see exploded view and Figure 4) will sometimes lock with the bracket (F), Figure 4, on the rocker-arm lever (75) if the drop of the record is delayed. More clearance can be obtained by bending the elevated hook (E) away from the bracket.

Erratic Indexing -

Indexing in the 10-inch or 12-inch position is con-

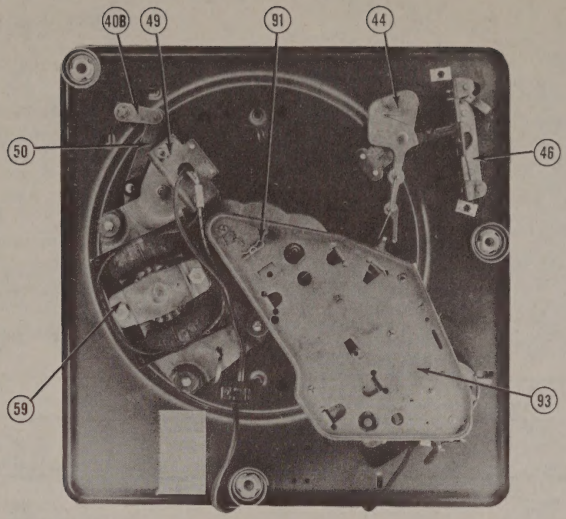

Figure 5

trolled through the presence or absence of pressure from the compression spring (79) on the pickup arm raising lever (92). In the 12-inch position, the spring should just be free. This allows the stud of the pickup arm raising lever (92) to follow the inside edge of the groove in the bottom of the main cam (69). While in the 10-inch position, the compression spring (79) applies pressure to the pickup arm raising lever (92), causing the stud of lever (92) to travel along the outside edge of the groove. Improper adjustment of the compression spring (79) will cause erratic indexing.

The spring may be adjusted by bending the slotted arm (part of 92), in which the selector lever (78) slides, for proper tension and smooth clearance.

Last Record Does not Play -

Bracket "F" not contacting the elevated hook "E" of the automatic shut-off lock lever (80). (See Figure 4.)

At the beginning of each change cycle, the rocker arm (75) moves forward slightly. Bracket "F" of the rocker arm is then moved underneath the elevated hook "E" of the automatic shut-off lock lever (80). This forward movement takes place before a record is dropped to the turntable. This prevents the lock lever (80) from engaging the raising disc (88) when the last record is dropped to the turntable, thus allowing the change cycle to continue. However, up to the last record, the weight of records on the spindle holds the automatic shut-off lever in a raised position.

If the last record does not play, bend the elevated hook "E" forward so it will overlap the push-off post bracket "F" about 1/32" with a record on the spindle.

Slide-In or Needle Jumps Grooves -

Slide-in is where the needle will touch the first groove of the record properly but will jump the grooves forward or back, as though the needle pressure were too light.

1. Check the needle tip. The standard tip will be especially likely to jump grooves of a microgroove record. Be sure the "microgroove" tip is used for either 33-1/3 or 45 RPM microgroove records.

2. Chipped or damaged needle.

3. Tight pickup cord.

Change Cycle Starts When Needle Touches 10-Inch or 7-Inch Record -

The velocity trip arm (84) may be too close to lip "B" of the velocity trip (65) (see exploded view) at the moment the needle touches the record. There should be at least 1/64" clearance between the velocity trip arm (84) and the lip of the velocity trip (65). Carefully bend lip "B" in to provide proper clearance. However, do not, in any way, bend the velocity trip at any other point. Improper bending may cause binding and constant tripping of the mechanism.

To Adjust Speed Selector Lever Position -

1. Loosen the set screw in coupling (40B), Figure 5.

2. Move idler assembly items (55, 56, and 57) to the 45 RPM position.

3. With the speed-selector lever (40) opening over "45," tighten the set screw.

LUBRICATION

Lubrication applied at the time of manufacture is usually sufficient for a long period of time. However, should it become necessary to relubricate, due to extreme conditions of dust, heat, excessive use, or the replacement of new parts, the mechanism should be cleaned with carbon tetrachloride and lubricated as follows:

Use No. 10 Oil (Apply with small oil can or medicine dropper).

1. Motor bearings.

2. Pickup arm shaft (12). Apply one drop each to the bottom bearing point and bracket hole through main baseplate.

3. Ball bearing assembly (26).

4. Idler wheel felt (23).

A Non-Fluid Lubricant (Apply with Small Brush):

1. Idler wheel link.

2. Turntable shaft stud.

3. Pickup arm hinge pins.

4. Knife edge of pickup arm raising lever.

5. Main cam bearing. It is necessary to remove the sub-plate assembly to lubricate this bearing.

6. Teeth of main cam actuating gear (64).

7. Track of main cam (69).

8. Teeth of large and small idler gears.

9. Raising lever bracket bearing surfaces.

PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	49X124-1C	Pickup Arm	47	46P117	Tension Spring - Trip Lever
2		Cartridge	48		7" Discriminating Shaft (Part of Item 33)
3	26P474	Cartridge Mounting Screw			
4&			48A	41P704	Positioning Cam
5	21X283	Pickup Arm Mounting Hinge	49	32P054	On-Off Switch
6		Pickup Arm Set-Down Adjusting Pin (Part of Items 4 and 5)		45P819	Switch Cover
			50	17X464	Index Plate and Cam Assembly
7		Washer	51	25P333	Lock Nut
8		Hinge Mounting Screw	52	26P687	Turntable Stud Mounting Nut
9&			53	25P222	Lock Washer
11	11X386	Pickup Counter Balance Assembly	54	26P046	Hex Nut
10		Pivot Pin (Part of Items 4 and 5)	55	11X460	78 RPM Pulley
12	11X385	Pickup Shaft Assembly	56	11X458	45 RPM Pulley
13	11X133	Spindle	57	11X456	33 RPM Pulley
14		Extension Shelf for 7" Records	58	46P187	Detent Lever Spring
15		Mounting Screw - Pickup Shaft Assembly	58A	46P139	Idler Wheel Tension Spring
			59	17X467	Motor and Top Bridge Assembly
16	49X074	Record Stabilizer Weight	60	25P363	Rubber Grommet
17	49X029	Record Stabilizer Post	61	41P592	Motor Mount Sleeve
18	46P126	Stabilizer Weight Spring	62	25P367	Washer-Motor Mounting
19		Phillips Head Mounting Screw	63	26P110	Screw-Motor Mounting
20	45P350	Housing	64	11X032	Main Cam Actuating Gear
21	11X366	Idler Wheel	65	11X320	Velocity Trip and Roller Assembly
22	50P125	Hairpin Clip	66	25P343	Washer
23	25P407	Felt Washer	67	25P342	"C" Clip
24	11X289	Turntable	68	25P343	Flat Washer
25	25P269	Flat Washer	69	11X033	Main Cam Assembly
26	11X058	Bearing Race	70	46P017	Rocker Arm Tension Spring
27	25P269	Bearing Washer	71		Rocker Arm Adjusting Screw
28	41P414	Turntable Bearing Stud	72	46P012	Compression Spring
29	47P023	Fibre Gear (Small)	73		Flat Washer (Part of Item 76)
30	45P342	Gear Coupling	74		Selector Lever Stop (Part of Item 76)
31	47P024	Fibre Gear (Large)			
32	41P333	Shoulder Mounting Screw	75	11X142	Rocker Arm
	11X132	Idler Gear Assembly (Including Items 29, 30, 31, 32, 53, and 54)	76	11X049	Selector Lever and Collar Assembly
33	11X472	7" Discriminating Lever	77	11X141	Roller and Rocker Assembly
34	49P125	Rest Post 10" and 12"	78		Selector Lever (Part of Item 76)
35	49P111	Reject Button	79	46P011	Selector Lever Compression Spring
36	11X139	Manual-Automatic Control Knob			
37		Set Screw	80	11X079	Automatic Arm Rest Lever
38		Spring Washer	81	41P421	Rocker Arm Pivot Pin
39	49P027	Control Escutcheon	82	46P139	Tension Spring Index Plate
40	42X205	Speed Change Knob	83	41P576	Velocity Trip Clutch Weight
40A	41P669	Bushing	84	45P568	Velocity Trip Arm
40B	17X466	Hub and Lever Assembly	85	23P009	Friction Disc
41		Baseplate	86		Hairpin Clip
42	24P022	Needle Pad	87		Set Screw
43		Speed Nut	88	11X227	Pickup Arm Raising Disc
44	11X158	Reject Trip Lever	89	46P022	Bracket Tension Spring
45	41P444	Reject Shaft	90	41P443	Automatic Rest Lever Pivot Pin
45A	46P123	Compression Spring	91	50P204	Spindle Retaining Pin
45B	45P361	Switch Lever	92	11X046	Pickup Arm Raising Lever Assembly
45C	45P872	Leaf Spring			
46		Reject Mounting Bracket Assembly	93		Sub-plate Assembly